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A Neighborhood Rapid Transit Center Arts Center Station, Atlanta, Georgia

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A NEIGHBORHOOD RAPID TRANSIT CENTER
ARTS CENTER STATION, ATLANTA, GEORGIA

A Terminal Project
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by

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To my parents,

Mr. and Mrs. Kenneth H. Brown

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Introduction

The specific aim of this terminal project is to design a rapid transit station for the Metropolitan Atlanta Rapid Transit Authority (MARTA). Whereas the trains and buses of the MARTA network will be highly visible and will be the essence of the transit system, the individual station will play a major role in the success of the system as a whole. The design of all stations must take into account the fact that the basic reason for the existence of MARTA is to develop and provide an economical means of transportation which is swifter, safer, more convenient, more pleasant, and more efficient than any other existing means of short-haul transportation available in the Atlanta area. Since the system is new, especially to the South, providing a new means of transportation for the Atlanta area, much of its success will depend on the attractiveness and efficiency of the individual stations. The quality of station design must, therefore, reflect a balanced relationship with the immediate environment,

and at the same time it must provide facilities for a smoothly functioning organization and operation.

1 Urban Mass Transportation

This section deals primarily with identifying some of the common points concerning urban transportation in American cities. The most identifiable trend in most cities is the sprawl phenomenon which is characterized by poorly planned growth. Planners attempt to check the sprawl phenomenon by organizing growth into a system of regional nodes and connecting these nodes to one another by integrating and coordinating existing modes of transportation and in some cities by introducing an entirely new mode such as rapid rail transit.

If a city may be thought of as a work of architecture, then transportation may be thought of as its circulation system and a significant element of its structure. Largely, the workability of the circulation system determines the form of the city.

In the United States urban transportation for the most part has meant development of streets and highways. In a few major cities where rail transit was established decades ago, public transportation systems are primarily downtown oriented. According to outdated ways of thinking, only the downtown generates enough demand to justify the use of mass passenger vehicles, and only then for a few peak hours. Now, however, most urban travel demand is not downtown oriented.[1] The result is an automobile system that works well for most people, a transit system that works fairly well for downtown commuters, and a virtual non-system for everyone else.[2]

Because people who are excluded from the automobile society cannot go where and when they please, they are not only denied the benefits of that society, they are injured by it.[3] As cities have developed outwardly, job opportunities have moved to the beckoning suburbs leaving poorer neighborhoods in the central cities. The result has been that poor mobility has kept many of those left in central cities from achieving gainful employment in suburban

industry and commerce. Not only have the members of underprivileged minorities been denied mobility by the sprawl phenomenon, but elderly persons and those younger than driving age have also been excluded. The lack of mobility brings about a subsequent denial of most of the amenities most cities have to offer, including social, cultural, and recreational opportunities.

In a planning sense, one alternative to urban sprawl is the organization of growth into regional nodes, with greater density and a wide range of facilities and activities which may not be found in traditional suburbs, and certainly not in concentrated centers within these suburbs. In many cases, rail transit is considered vital in initiating and maintaining the trend toward these regional nodes and in linking them to one another and to the core city.[4] In our current situation, however, while there are many people who depend on transit for their mobility, they are too few to support a transit system extensive enough to provide anything approaching the mobility that automobile drivers have. The

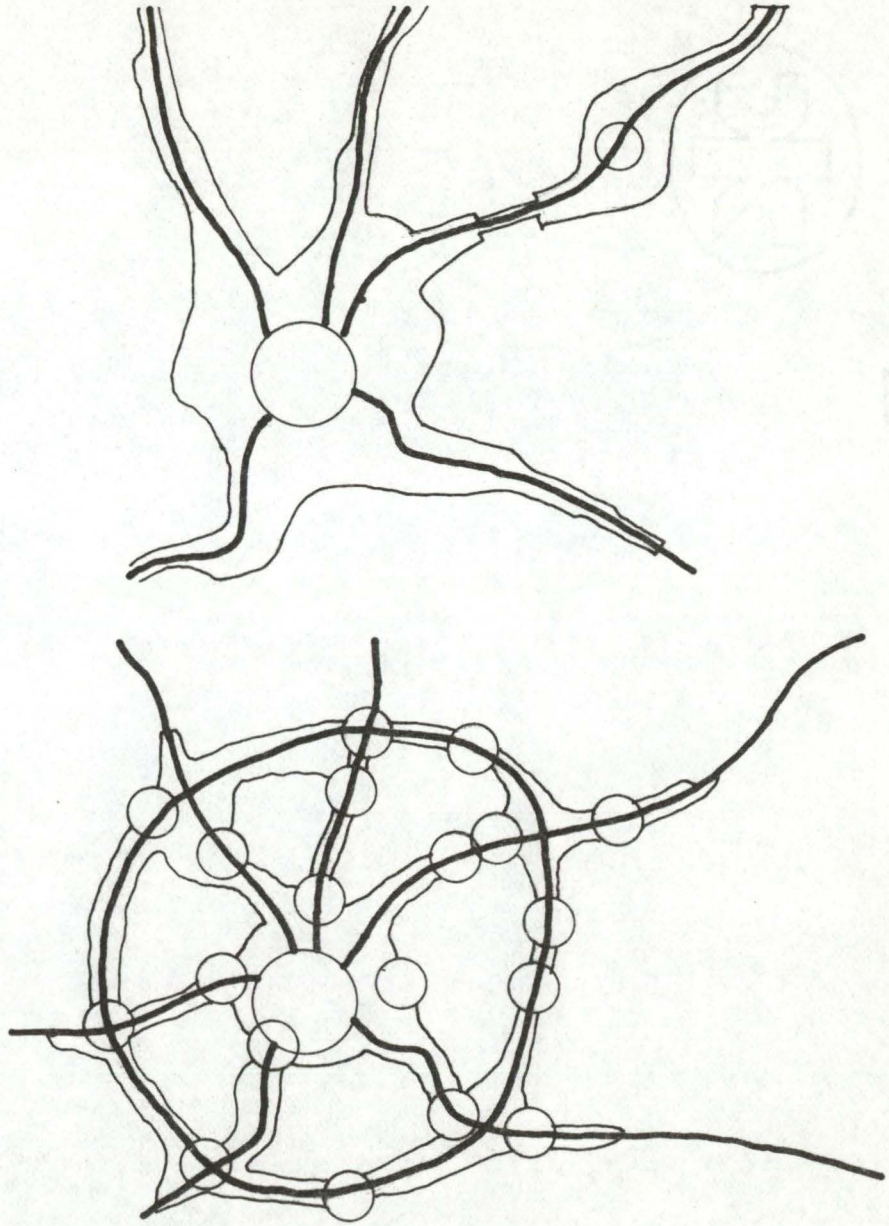


Figure 1. Sprawl Phenomenon and Reorganization Concept.

frequency and coverage of transit service are determined by the number of people who are willing to use transit. If these people are relatively few, the system will provide relatively little coverage and relatively infrequent service; and the mobility of those who must use such a system is correspondingly circumscribed.[5]

It is, therefore, the optional or marginal user who will be the determining factor in the development of future transit systems. A system for those who most need it cannot come into being without the sanction of the optional user. It only makes sense to attract this optional patronage if it generates enough marginal revenue to offset marginal costs and thereby to buy better transit service for everybody.[6] And the best way to go about attracting this optional patronage is to provide an alternative that transports people more swiftly, more pleasantly, more conveniently, more safely, and more efficiently than any other means of short-haul transportation available in the region.

While rapid rail transit may be thought of as such an alternative, nevertheless, it cannot realistically be thought of in terms of reducing or relieving highway congestion, at least not in absolute terms. By its nature, rapid transit is an inherent shaper of urban form. The stations of a transit system, strung along their invisible (underground) path systems, will be strategic junction nodes, attracting large numbers of people, and becoming inevitable magnets for concentrated development nearby.[7] Thus, they encourage growth and further congestion as Montreal and Toronto bear witness.[8]

Rapid transit, therefore, cannot and probably should not compete effectively with highways without working within the framework of existing streets and highways. Rail transit alone cannot offer door-to-door service as automobiles do. On the other hand, buses represent a highly promising point of departure for improving urban transportation. The reason is that they can go anywhere on rights-of-way already acquired and prepared. This factor is hardly

insignificant. It means, first, that buses have the potential for providing door-to-door service, an absolute essential for meeting the needs of the disadvantaged, and, second, that the system can provide chauffeured transportation at low cost.[9] In some cities transportation planners have discovered that busways, exclusive bus-taxi-and-carpool lanes, have precluded the necessity for more comprehensive transit systems;[10] however, the concept can become easily counterproductive when it is considered that particular lanes may not be carrying their designated volumes.

It is important to note that current trends toward urban sprawl must be checked in order to ensure orderly growth in metropolitan areas and that one manner in which sprawl may be checked is by reorganizing growth into a system of subcenters relating to the city center. And it is equally important to note that neither expanded highway systems alone nor entirely new transit systems alone are going to interconnect these subcenters; rather, when rapid transit is integrated and coordinated with highways, surface

streets, and buses, the resulting interrelated system can best serve all districts of the metropolitan area. Clearly, in certain urban areas rail transit systems integrated with bus systems can offer a greater degree of mobility to a greater number of people than ever before while opening vast new opportunities for concentrated development.

2 Mass Transportation in Atlanta

Rapid growth and resulting traffic congestion have afflicted virtually all metropolitan areas, but the idea of integrated rail and bus transit is especially new to Atlanta. Atlanta's rapid growth and its geography have led to a dominant street pattern, north-south oriented for the most part, which relates outlying areas to the center of the city but not to each other except when they are located along one of the radial paths converging at the center of the city. Atlanta's existing modes of transportation more or less reinforce this radial development trend. The advent of rail transit is likely to aid greatly in redirecting and controlling Atlanta's growth and in interrelating the various districts of the metropolitan region. That Atlanta has embraced the idea of mass transit is in itself an indication of the need for such a complex transportation system. In order to understand how Atlanta has come to realize

the need for a rapid transit system, it is necessary to examine briefly the physical, economic, and socio-political growth of Atlanta over the last quarter of this century.

Partly as a result of its geographical location, Atlanta has become a regional transportation center. Atlanta's role as a transportation center has caused it to become a regional commercial and industrial center, as well. Atlanta has become the premier city of the entire southeastern United States; it has become perhaps one of the most accessible cities in the nation, certainly in the South. Its earliest accessibility was by rail and then by air and by superhighway as the latter two systems have themselves evolved. Atlanta has grown rapidly, and this rapid growth has seen a number of noteworthy trends. Much of the new population drawn to the Atlanta area has settled in the outer areas rather than in the city center. Recent development has tended toward low-density, sprawling residential, office, commercial, and industrial development. The early trend toward decentralization of the region has been difficult to reverse.

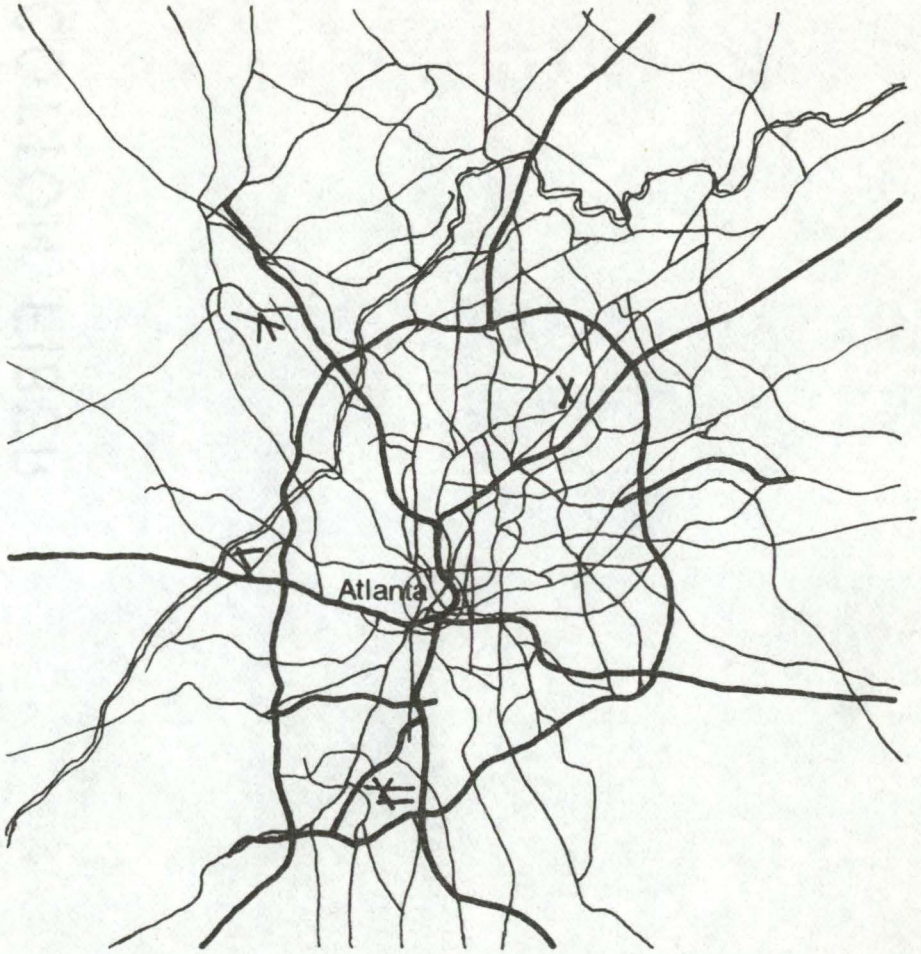


Figure 2. The Atlanta Region.

The dominant street pattern in the Atlanta region, however, consists of radial-type roadways converging on the downtown area. Very few cross-town (east-west) or circumferential-type roadways possessing the necessary continuity, geometric alignment, and sufficient width are available for east-west travel.[11] Principal access into and through the area is via the major north-south streets radial to downtown.

Atlanta's system of superhighways is fairly comprehensive and nearly complete, but the system is radial and primarily north-south oriented. Interstate Highway 285, a circumferential highway, reinforces the radial concept. The radial concept also emphasizes and reinforces the relationship of the central core to outlying areas without relating the outlying areas to one another very well.

Atlanta has been served by a bus system, Atlanta Transit System, which itself was anteceded by a trolley and streetcar network. The system has always provided wide service, and as a direct result of

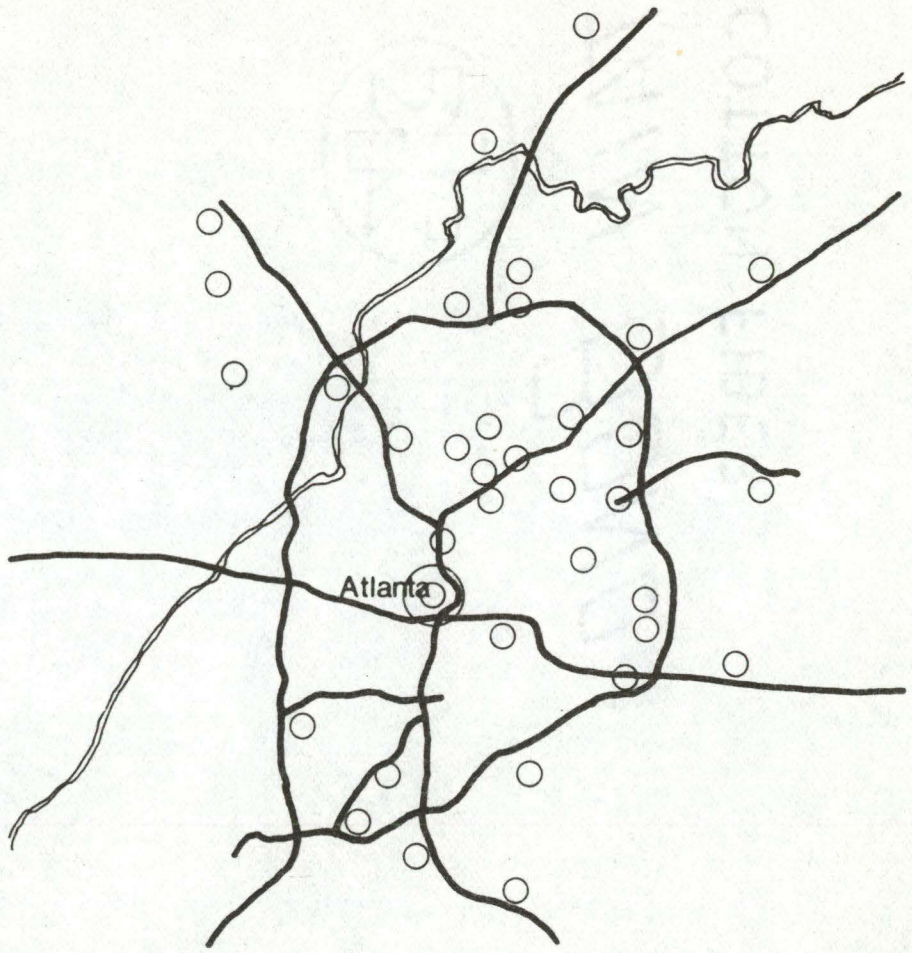


Figure 3. Regional Subcenters.

the nature of Atlanta's street network, its service has catered to the same suburban-downtown patronage without serving very well those travelers who wish to go from one subcenter to another.

As the volume of automobile traffic has increased over the years, and as these superhighways have approached completion, the volume of bus patronage has declined. The automobile, itself a symbol of mobility and social standing, has placed on mass transit such a stigma that for the most part, a typical cross-section of transit patrons has included underprivileged and minority groups plus those who have not been able to drive for other reasons.

The Metropolitan Atlanta Rapid Transit Authority (MARTA) was created in 1965 by an Act of the Georgia General Assembly. On November 9, 1971, the citizens of Fulton and Dekalb Counties and of the city of Atlanta approved a referendum for a $1.4 billion mass transit system which would include purchasing and improving

the existing bus system, designing, constructing, and maintaining a fully integrated, reduced fare, bus and rail rapid transit system.[12]

In February of 1972, MARTA purchased the Atlanta Transit System and set about improving bus service in the metropolitan area. Simultaneous implementation of a one percent local option sales tax (to finance the local obligation of the system) and uniformly reduced fares brought about a thirty percent increase in patronage in sixteen months of operation. Ninety-one percent of the increase was attributable to "new" riders, two-thirds of whom previously drove or rode in an automobile as a passenger. One quarter of the new riders previously walked or made no trip at all. Innovations and improvements in the system have been responsible as well for increased patronage. "Park-and-Ride"and "Kiss-and-Ride" access to transit service has served to increase ridership.[13] The new riders have shown a greater propensity to make trips other than home-to-work by transit. In non-peak hours, elderly patrons enjoy reduced fare, and handicapped patrons receive special attention.

MARTA has counted on fare reduction, service improvements, and public image to draw riders who would otherwise drive, walk, or make no trip at all.[14]

The effects of the MARTA system, however, will not be limited to its transportation impacts. As the rapid rail network is implemented, it is anticipated that the whole route system will be transformed from a radial system to a series of decentralized local routes. The rail network will assume the bulk of the radial volume and the bus system will operate from each transit stop along the way. The individual stations will therefore assume an importance never accorded them in transit systems of decades ago. MARTA planners look at the transit system as a development tool. The stations will affect land use patterns, social and economic conditions, environmental quality, housing opportunities, and urban form and design in areas where they are located.[15]

In a broader planning sense, each transit station may begin to act as the focus of a new employment and commercial center. The

results could mean tapering growth in the central city simultaneous with more intense development around subcenters. At the same time, the trend of urban sprawl could begin to reverse as the subcenters emerge as the strong areas of development potential.[16] Meanwhile, the inconvenience of Atlanta's radial and primarily north-south oriented street network would decline as the rail transit system began to assume a significant volume of ridership.

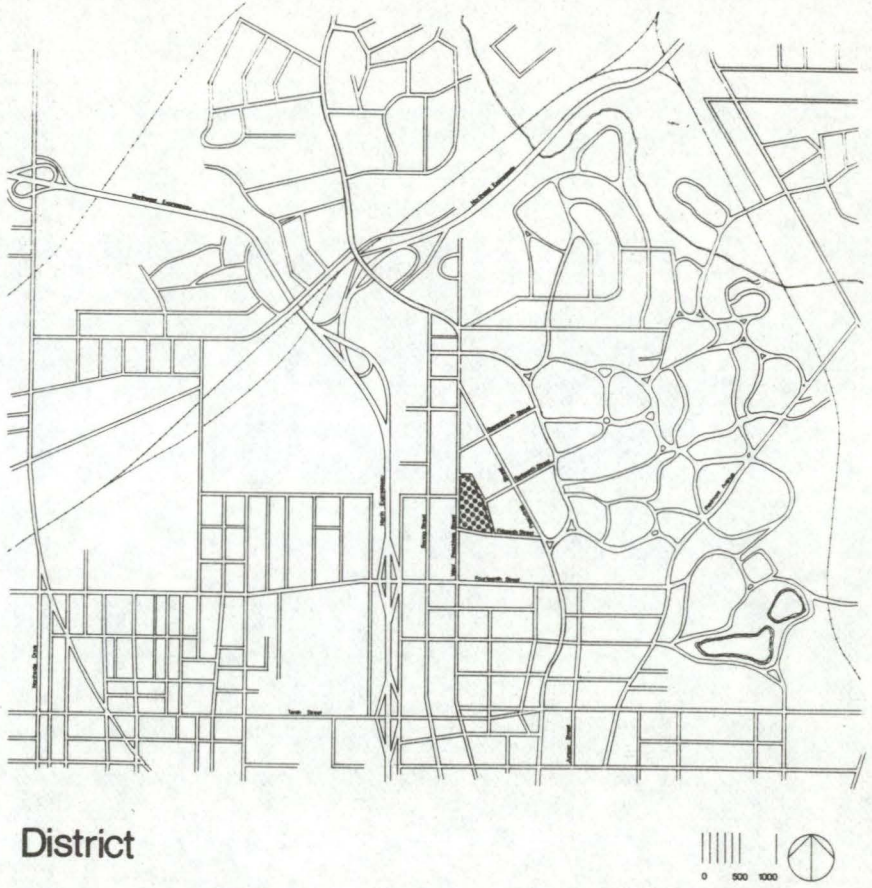


Figure 4. The Arts Center District.

3 Arts Center District

MARTA's regional subcenter concept divides the metropolitan area into a number of districts served by one or more transit stations. Arts Center Transit Station Area is one of these districts. A high development potential will be created around the station by its situation relative to Downtown Atlanta, its location along the Peachtree Corridor, and its position straddling the Peachtree Ridge, a major topographic feature. The Arts Center District is located approximately two and one-half miles north of Downtown Atlanta along Peachtree Street, a very important north-south street. MARTA expects that the area surrounding each rapid transit station would come to be divided into three distinct zones, a core zone where most development would be encouraged, a transition zone surrounding the core zone, and a preservation zone so that the district might retain its identity. In the case of Arts Center Station, such establishments as the Atlanta Memorial Arts

Center and Colony Square have already become indicators of the type of development MARTA will encourage in the core zone while surrounding residential neighborhoods indicate the identity of the district as a whole. The subdivision of the district into three zones would antecede the establishment of Arts Center District as a full-fledged regional node in the overall framework for the Metropolitan Atlanta Area.

Such massive development potential will require much planning and control. MARTA planners think of the district in terms of three concentric zones, the core zone, transition zone, and preservation zone. It is the core zone where most development is anticipated with a moderate amount of development in the transition zone and marginal development in the preservation zone. The core zone would cover an area roughly six hundred to one thousand feet in radius from the transit station. This area represents the optimum walking distances from the station. It

would contain multiple use at high densities and would be transit-pedestrian oriented with no commercial parking.

The transition zone would experience a moderate amount of development, but this development would relate the scale of new core zone development to the scale of existing neighborhoods in the preservation zone to avoid detrimental environmental impact of height and bulk.[17] The preservation zone would remain for the most part as it exists, especially the residential neighborhoods, but programs would be devised for their improvement and/or orderly change.[18]

The coming of MARTA and subsequent future development will likely increase traffic, and pressure for land-use changes will have an adverse impact on area neighborhoods.[19]

The Arts Center District is composed of five strongly defined neighborhoods or functional areas. Home Park is a low-density residential neighborhood located on the western side of the District.

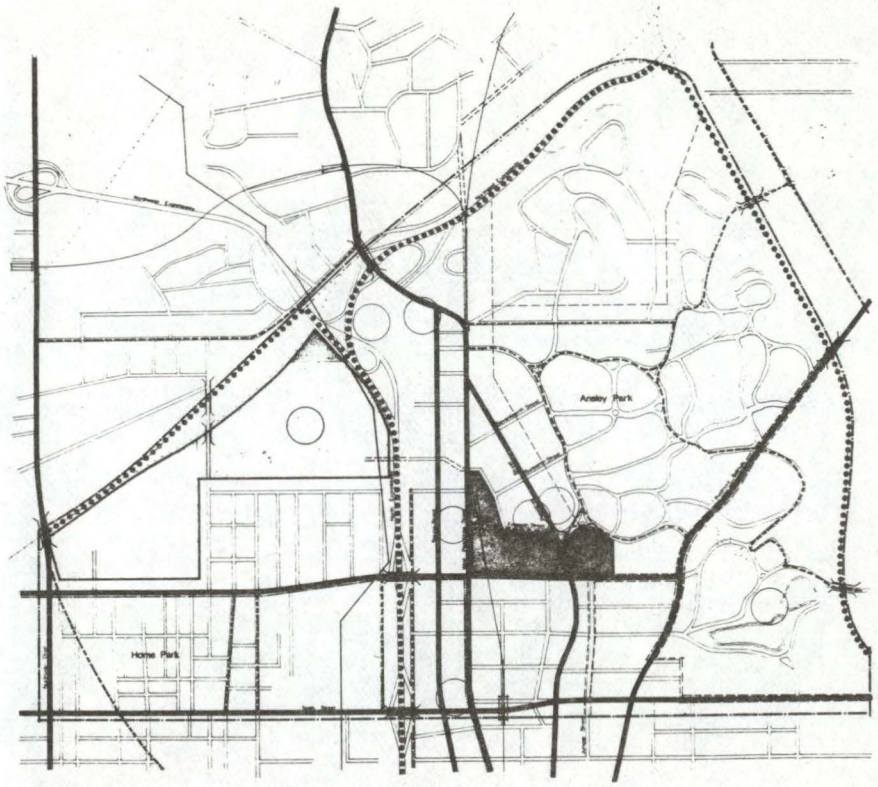


Figure 5. District Design Parameters.

The Peachtree Corridor bisects the District in a north-south direction and provides the primary circulation and development focus. Ansley Park and Sherwood Forest are both low density, predominantly single-family neighborhoods located in the northeast quadrant of the District. Piedmont Park, a major park serving city-wide passive and active recreation, is situated on the east side.[20]

The District has definite edges which, because of their nature, act as barriers on the east and north. Clear Creek and the Southern Railway combine to form most of the eastern edge. A high-tension transmission line reinforces the eastern edge for half its length. The Southern Railway defines the northern edge, and it is reinforced for half its length by the Northeast Expressway. The North Expressway bisects the area north-south. Edges on the west and south take the form of land-use changes.[21]

Two potential nodes whose development will likely influence the nature of the Arts Center Station are Colony Square, a prestige office, residential, and shopping complex on Peachtree Street

between Fourteenth and Fifteenth Streets, and a two-hundred-acre tract of land owned by Atlantic Steel and marked for mixed use, transit-oriented development. Colony Square represents a new mixed use development concept on the order of that expected to be generated by the advent of MARTA, a concept likely to produce a major impact on the surrounding neighborhoods and surface street system, particularly in respect to automobile orientation.[22]

The likelihood of intense residential, office, and commercial development will be the greatest influence of the District as a whole upon the design of the MARTA Arts Center Station. At the same time, existing land use and existing circulation will be important considerations in the design of the station.

4 Arts Center Station Site

The immediate site of the Arts Center station will become the center of the District and the focus of its development and sense of community identity. It is therefore important that prime consideration be given to the accessibility of the site to all potential users, whether they arrive by bus, automobile, bicycle, or on foot. It is important also that pedestrian and vehicular traffic be separated insofar as possible in order to increase safety, comfort, and convenience for everyone. One likely way of achieving this segregation would be vertical separation. The path of MARTA underground lines will be developed into a linear park which will enhance Arts Center Station's accessibility to pedestrians and bicyclists while simultaneously offering them another alternative, if limited, mode of travel. At the same time, the site of the MARTA station must relate well with existing landmarks such as Colony Square and the Arts Center itself.

Figure 6. Neighborhood Design Parameters.

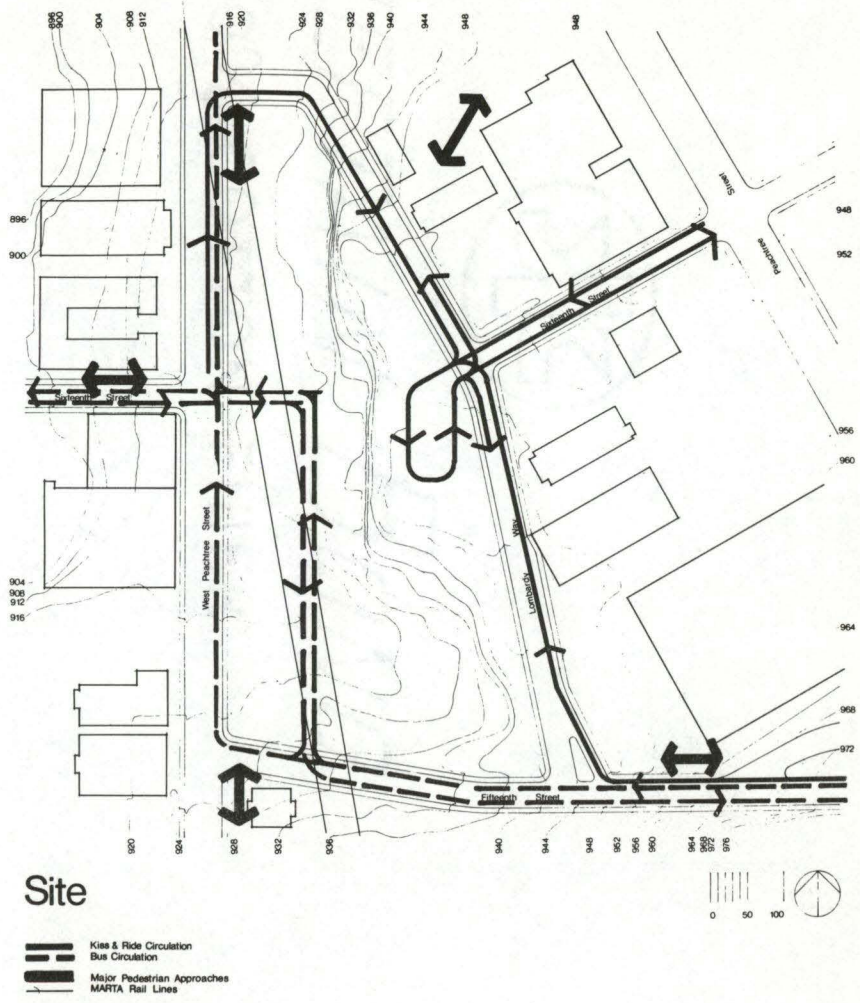


Figure 7. Site Design Parameters.

The site comprises the six acres bounded on the north and east by Lombardy Way, on the south by Fifteenth Street, and on the west by West Peachtree Street. Directly to the east and across Lombardy Way is a local landmark, known as the Atlanta Memorial Arts Center. The Arts Center's location relative to the Arts Center station will improve greatly its accessibility to Atlanta, and Dekalb and Fulton County residents.[23] At the same time, it will likely generate patronage at off-peak hours. The relationship between the Arts Center and the transit station is important and should be emphasized in keeping with MARTA's policy of identifying with civic and cultural themes. The form and mass of the Arts Center itself will have a great influence on the transit station. A pedestrian bridge to link the Arts Center to the station should be considered to maintain the segregation of pedestrian and vehicular traffic.

MARTA's rail system will be constructed underground through the Arts Center District, and the transit station will therefore be a

subway station. The underground rail lines will eliminate conflicts between rail and street traffic. Meanwhile, the path of MARTA's right-of-way between North Avenue to the south and the Arts Center Station will be developed and maintained as a linear park varying in width from fifty to two hundred feet. This linear park will provide much-needed park space while reinforcing the idea of improved pedestrian access to new development and to the transit station. Along this linear park would occur secondary branches which might traverse Peachtree Street to Colony Square's pedestrian plaza or which might traverse West Peachtree Street to proposed high-intensity residential, office, or commercial development.

The likelihood of high-intensity development on the two-hundred-acre Atlantic Steel property will create a need for a physical link across the North Expressway between that tract and the transit center. In hopes that development of Atlantic Steel property would not be primarily automobile oriented, the link between Atlantic Steel and the transit center would involve a system of

light rail mini-cars. At any rate, provisions for inclusion of such a system should be made contingent upon final development status of the Atlantic Steel property.[24]

The station will provide access to residents of Sherwood Forest, Ansley Park, and Home Park neighborhoods. The Home Park neighborhood is declining as a single-family residential neighborhood as pressure for land-use change mounts. Ansley Park and Sherwood Forest, on the other hand, are more likely to survive in their present forms. The station will provide access as well to office and apartment development along Peachtree, West Peachtree, and Spring Streets. Where volumes of pedestrian traffic do not warrant vertical separation, a positive contrast in paving patterns and good visibility should help reduce conflicts and promote safety.

Vehicular access is via Fourteenth, Fifteenth, and Sixteenth Streets from the east and west, and via Peachtree, West Peachtree, and Spring Streets from the north and south. Proximity to Fourteenth

Street is important in the location of the station because of its role as an east-west artery. The intersection of West Peachtree and Fifteenth Streets will be realigned in anticipation of increased volume of bus traffic thereupon. Meanwhile, in the neighborhoods of the preservation zone, a number of streets will be closed, blocked, or altered in an effort to reduce or eliminate through-traffic therein.

MARTA will discourage parking within the core zone and will encourage a pedestrian system of circulation. A small amount of "Kiss-and-Ride" parking space should be provided, at least initially, to accommodate patrons who may not wish to walk or use buses. These spaces should be situated so that they will not impede access to the station by pedestrians or buses. At the same time, "Kiss-and-Ride" parking should provide its patrons with easy access to fare vending and collecting functions. Areas for parking bicycles should be provided near station entrances, as well. Emphasis will be directed toward development of a central

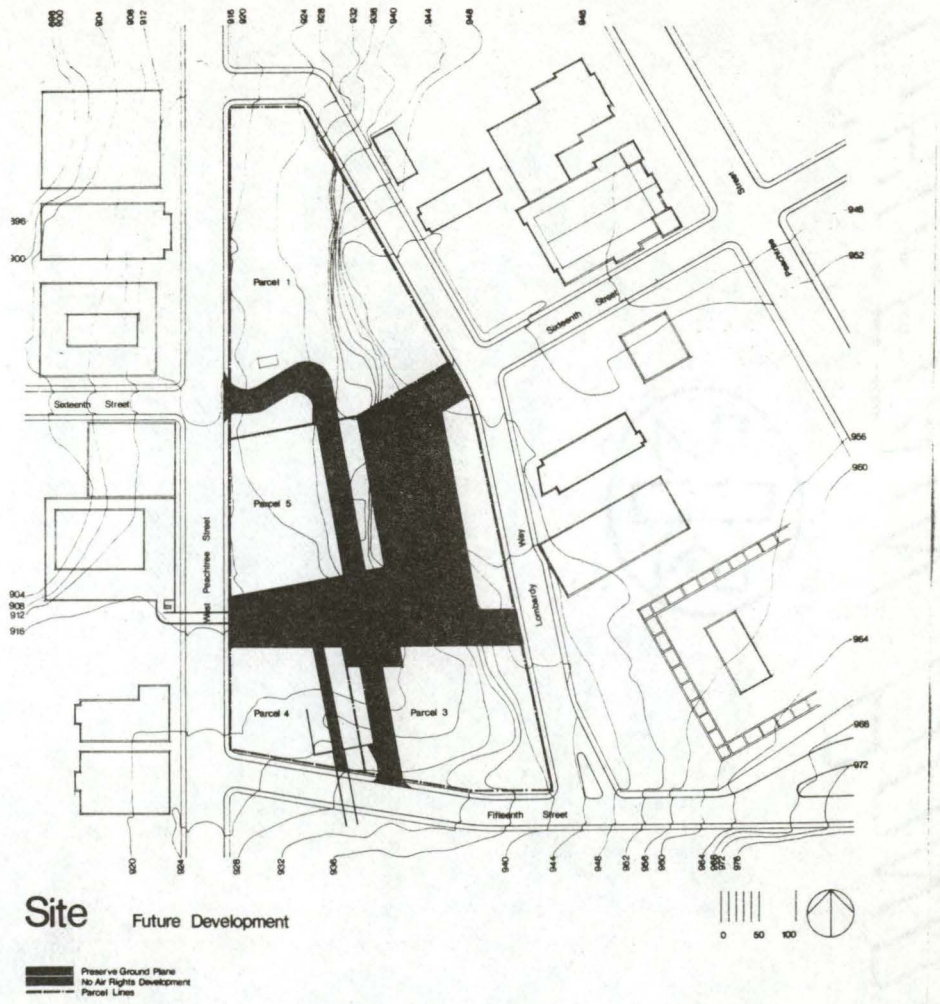


Figure 8. Future Development.

public plaza likely located adjacent to the transit center.[25] Such a plaza would combine public and private functions and become the community focus for functional areas in the preservation zone.[26] A full range of community facilities and services for the District might be located within the six-hundred-foot radius of the core zone, including public space for active and passive recreation, child care, convenience and specialty-type commercial development, and such things as theaters and restaurants to make for a social environment.[27] Twenty-four-hour activity should be promoted.

Certain aspects of the site will have great bearing on the design of the station. First of all, it will be an underground station, and the right-of-way leading to it will become a linear park. The form of the Atlanta Memorial Arts Center will overshadow the transit station itself, and will likely be a major influence on the design of the station. The topography of the site itself will facilitate the vertical segregation of vehicular and pedestrian activity which

must at any rate be accommodated. By improving vehicular access and by developing and promoting a zone geared to pedestrian use, MARTA will be helping to guide development in the Atlanta Area in a way consistent with Atlanta planners' philosophy.

5 Arts Center Station Design Criteria

The Arts Center Station itself, the epicenter of a regional district, will be the point of arrival or departure for an estimated forty-three thousand persons each day.[28] A number of important issues must be taken into account in order to introduce these patrons into the Arts Center District with facility and pleasure and with the least amount of confusion, inconvenience, and discomfort. Among these issues is, first of all, the interpenetration of public spaces, important in maintaining the image it is hoped the trains will convey and important in dispelling the undesirable feeling of being underground. A second important issue is the ease of circulation necessary to move large numbers of people among various transportation modes on various levels. A third issue is safety and security for patrons and for the station itself. The likelihood of great amounts of development, even air rights development, raises a fourth issue: discreet presence of the station, yet unmistakable

identity among high-density developments. The fifth issue concerns the trains themselves and support facilities for both the trains and the station, as well as patron comfort. Acoustic levels, especially where trains are concerned, will not exceed comfortable levels in order that the rapid transit system might be even more attractive to patrons. These issues plus some lesser issues will be further explored in the course of this chapter.

The interpenetration of spaces can be a most effective design tool in underground architecture simply by virtue of the fact that it helps to dispel the feeling of entrapment often experienced by patrons in subway stations. Interpenetration also makes the trains, which are the essence of the system, more immediate while at the same time it seemingly enlarges all public spaces. One possible consideration regarding interplay between levels is the inclusion of natural lighting when such inclusion is practical.

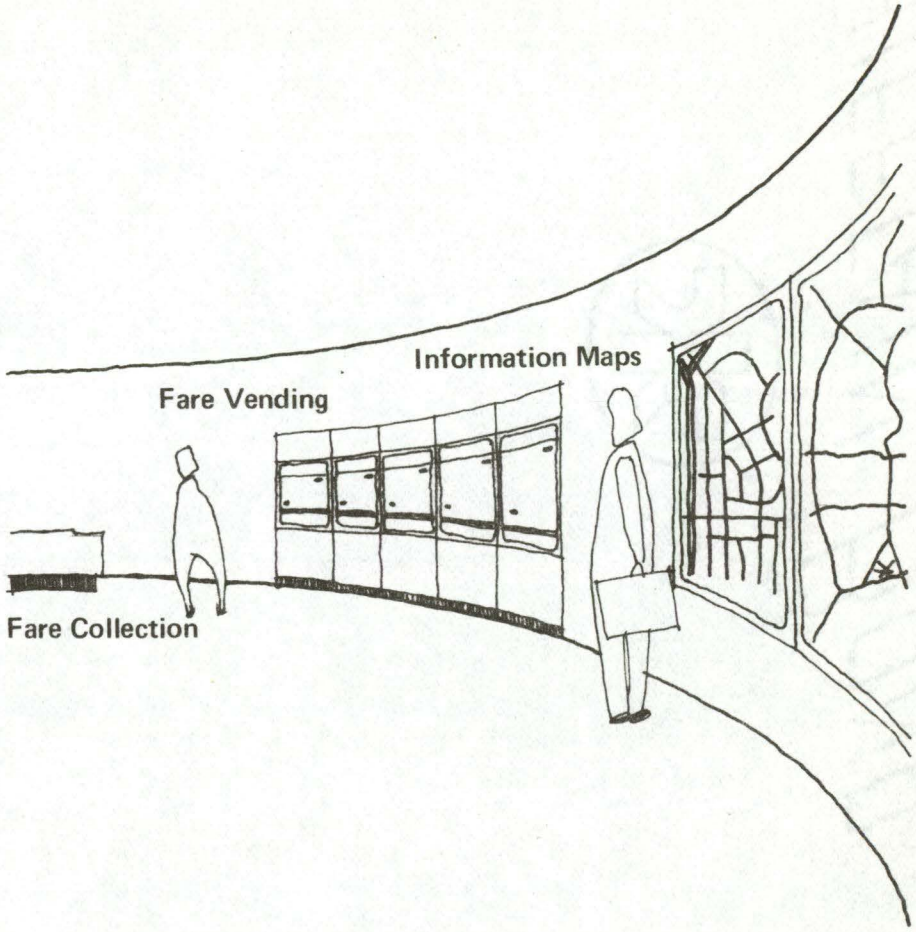


Figure 9. Information and Ticketing.

Circulation is the vital principle in a transit system, and a station is the place where nearly all types of circulation in use in cities meet in some fashion. The concourse is the first part of a station encountered by patrons who come by auto, bicycle, or on foot. The concourse is divided into a free area where fare vending and collection occur. Before entering the paid area, which is beyond the fare collection gates, prospective patrons must be able to consult directional and informational signs and maps. Fare vending machines should be located on the right-hand side of the free area because people generally tend to keep to the right. At each vending machine should be provided at least fifteen feet of queuing space while at each fare collection gate should occur at least twenty feet of queuing space. In keeping with MARTA's policy of providing for wheelchair patrons, a special fare collection gate capable of handling wheelchair patrons should be provided.

The paid area of the concourse should lead directly from fare collection gates to mezzanines. Bus patrons enter directly from bus platforms into the paid area, thereby avoiding fare collection gates. The concourse itself should be free of visual clutter which might serve to confuse or delay patrons en route to or from trains.

The mezzanine is the second important space generally encountered by patrons. The mezzanine is a transition area between concourse and platform and must be open and free of visual clutter so that passengers may choose direction. It must also be arranged so that once a passenger has reached a platform he may then reach the other platform without passing through a fare collection gate. In some cases, the mezzanine level and the concourse level may occur on the same level.

The platforms themselves are reached from the mezzanine and therefore only after fares have been paid. Platforms must be six hundred feet long in order to accommodate eight-car trains,

and they must be at least twelve feet wide per train track. The one and one-half feet nearest platform edges must have a different floor covering which must present a change underfoot perceptible to a blind person. A nominal amount of seating must be provided, and trash receptacles must be located near escalators and stairs, and at other strategic spots.

Vertical circulation will be provided primarily by escalators and stairs, with ramps wherever practical, and elevators for handicapped and elderly patrons. Stairs and escalators will have at least twenty feet of queuing space at beginning of initial runs.

The issue of security and safety relates closely to the issue of straightforward circulation. It is important to avoid dead-end spaces, dark obscure corners, and freestanding columns. Closed-circuit television cameras must be placed so as to cover all public spaces, vertical circulation spaces, toilet entrances and station entrances. Lighting levels must be sufficient for

general purposes and for reading, as well as to ensure feelings of security in patrons. Highlighting by wall washing is generally preferable to pools of light on floors, and lighting fixtures should be out of arm's reach in order to avoid vandalism and stealing. Emergency and public telephones should be provided, emergency telephones in strategic locations, and public telephones in the free area. Activities involving money changing are allowed in the free area. Newsstands and automated vending may be allowed within the station, but are discouraged. Commercial activities, however, are encouraged as close to station entrances as possible. In order for patrons to use rapid transit, they must be made to feel comfortable, unconfused, and secure.

The fourth design issue is the discreet presence among all the development likely to occur in immediate proximity to the station. The entrances must be visible, protected, consistently marked, and convenient to all modes of access, as well as to

entrances to surrounding buildings. It is important to note that MARTA is counting on visibility to maintain its image, yet it is equally important that MARTA's station entrances should be located with discretion.

The fifth important design issue is the support functions including electrical service for trains and station, mechanical service for public areas, and staff and maintenance functions. A traction power substation controls power supply to trains. A station train control room, on the other hand, controls power supply to idling trains. Fan rooms, located at platform level, exhaust heat caused by braking action in trains. This exhaust occurs beneath platforms and goes to the outside by means of air shafts. These activity areas should be located at train level where possible and should be closed to public access.

Other activity areas should be located on concourse level, but for the most part these activities involve maintenance and staff functions. A building maintenance room and maintenance room

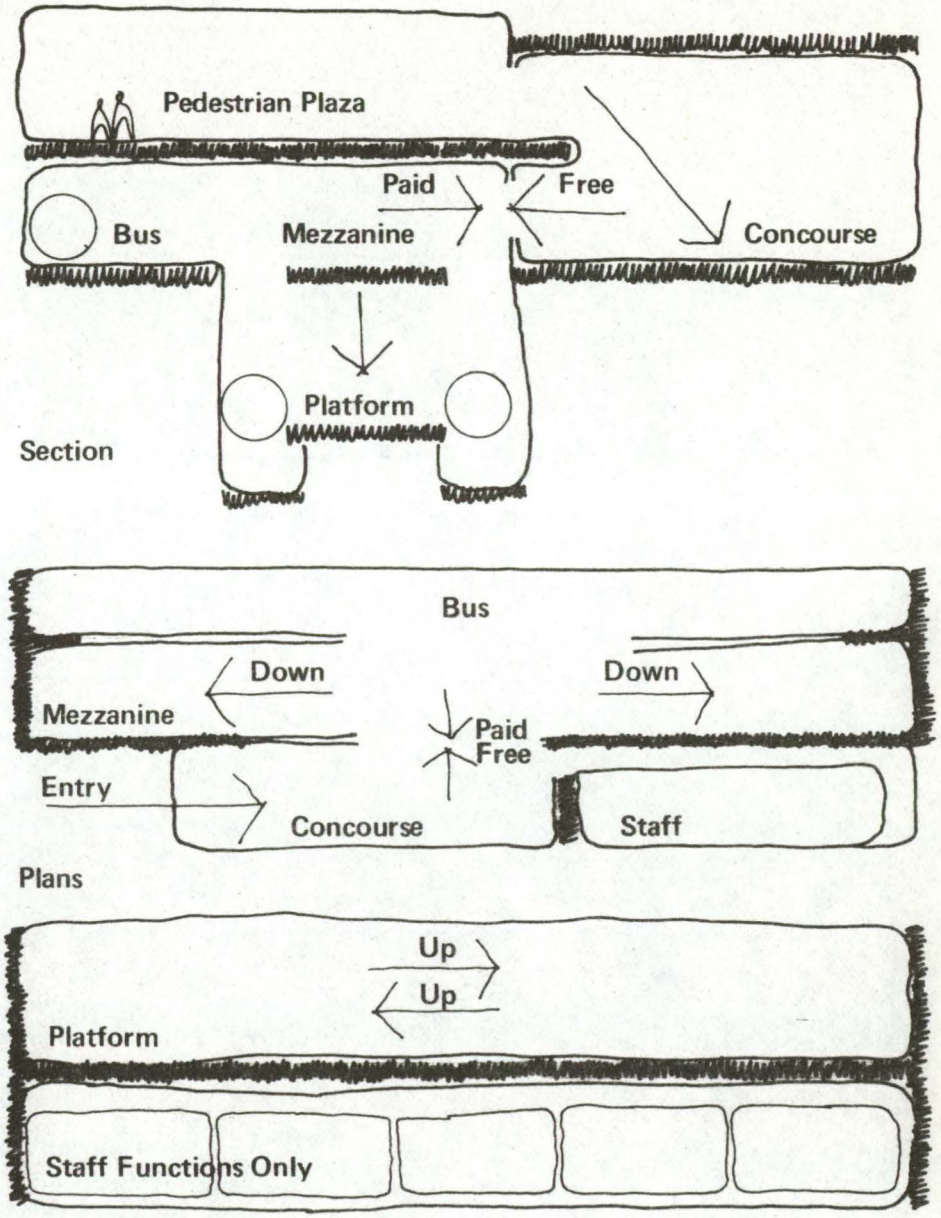


Figure 10. Conceptual Diagrams.

should be located within the paid area but without direct public access. The same conditions apply to toilets and locker rooms which are for staff and emergency use. In addition, a money collection room and a trash room should be provided beyond the secure entrances to the station so that pickups may be made at any hour of the day.

Acoustics are important to comfort and safety and should be considered as a sixth important design issue. The trains have been designed to be much quieter than traditional steel-on-steel trains; however, the noise level at platforms could still exceed danger levels without the imposition of certain standards. The highest allowable noise levels will be those caused by passing trains and will not exceed eighty-five dBA at a distance of six feet from platform edge while maximum reverberation time will be one and one-half seconds at five hundred Hz. Ceilings and walls must have an absorption coefficient of 0.60 at five hundred Hz, and at least thirty-five percent of combined ceiling and wall surfaces must be treated acoustically.

The integrity and simplicity of the structural system will be important as a design issue in that they will largely determine the cost and success of the station. The station will be underground for the most part, and its construction will involve excavating, building the structure, and backfilling. This system of construction is widely known as the "cut-and-cover method."

These seven fundamental issues are not the only issues; they are merely the ones perceived as more important and therefore deserving of greater attention. Other issues include fire protection, materials and finishes, graphics, advertising, and artwork. The National Building Code, for the most part, is the standard for MARTA construction. The National Fire Protection Association Code 101 (1967 edition) governs fire protection precautions. Materials and finishes should be selected with it in mind that surfaces should be easy to maintain, non-slip, vandalproof, and visually appealing insofar as

color and texture are concerned. Graphics should be clear and concise, unobscured, and consistent. No confusion should result from mistaking advertisements for directional and informational signs. If artwork is combined into station design, it must be well protected from the elements as well as from vandals, and it should not present obstacles to patrons as they circulate through the station. These lesser issues may be further clarified by accompanying diagrams and appendices.

The resolution of these seven basic issues, interpenetration of spaces, straightforward circulation, safety and security, discreet presence, support functions, acoustics, and structural integrity, as well as the resolution of the minor issues, fire protection, materials and finishes, graphics, advertising, and artwork will result in the design of a rapid transit station which serves its patrons conveniently, safely, and efficiently.

ACTIVITY AREA	MINIMUM DIMENSIONS L (in feet)	W	H	AREA (sq.ft.)	USER ACCESS: Public Free	Public Paid	Limited Public	Staff Only	MECHANICAL: Heated	Ventilated	Air-Conditioned	Closed-Circ. TV	Acoustics (35% coverage combined ceilings/walls)	Lighting Level in foot candles	FURNISHINGS	NOTES
Concourse				15000	•	•					•	•	•	25	12 fare-vending machines; 8 turnstiles; 1 specially equip. turnstile	Station Agent's Booth
Fare Vend/Collection					•	•					•	•	•	40		
Staff Room			8	180			•		•		•			40	1 desk; 3 chairs; First Aid Sta.	
Trash Room				100				•						15		Locate Outside
Vault	8	8	8	64				•						15	8" concrete walls w/2-way reinforcement or equivalent	Closedown Locate Outside
Toilet & Locker (Men)			8	140			•		•		•	•		25	1 toilet; 1 urinal; 1 lavatory	Closedown
Toilet & Locker (Women)			8	140			•		•		•	•		25	1 toilet; 1 lavatory	
Custodial Room			8	150				•		•				15	1 mop sink; shelves	
Electrical Room			8	100				•		•				25		
Bus Platform	500	12	10½	6000	•							•		25	Benches; waste receptacles	May occur at Mezz.
Mezzanine				6000	•						•	•	•	25		
Train Room	600	60		36000	•					•	•	•	•	25/15		
Platform	600	30		18000	•						•	•	•	25	Benches; waste receptacles	
Custodial	10	6		60				•		•				15		
Support Functions								•		•						
Fan Rooms (4)	35	35	15	4900				•		•				25		Provide air shafts for exhaust.
Train Control Room	35	40	15	1400				•		•				40		Locate at least 50' from traction power substation, at least 10' from aux. elec. room, provide 2 separ. walls
Fan Room	10	15	15	150				•		•				25		
Battery Room	10	15	15	150				•		•				15		
Auxiliary Electric Room A	25	40	14	1000				•		•				25		Locate at least 50' from traction power substation, at least 10' from train cont. room
Auxiliary Electric Room B	20	35	14	700				•		•				25		
Building Maint. Storage	10	15		150				•		•				15		Locate within 200' of platform end, 50' from train cont. room, 50' from aux. elec. rooms
Traction/Power Substation	40	90	18	3600				•		•				25		

Figure 11. Building Design Parameters.

6 Case Studies

This section deals with station design in two rapid rail networks only now nearing completion in Washington, D. C. and San Francisco, California. MARTA can benefit from the experiences of both systems because each city has approached station design in a different manner, and designers of MARTA's stations can capitalize on mistakes and exploit opportunities which Washington and San Francisco offer. The fundamental difference between the two systems is that Washington has hired one architectural firm to design all stations and, further, to strive for visual identity while San Francisco has hired engineering consultants who have largely designed all stations, leaving various architectural firms to do working drawings, finish work, and specifications.

Washington, D.C. Metro

The Washington Metropolitan Area Transit Authority (Metro) hired the firm of Harry Weese and Associates only a few months after the hiring of Deleuw, Cather, & Company, the engineers and planners, and gave the two firms equal status. Such a situation was new to rapid transit, but it has turned out for the better, by many accounts. After touring existing transit systems around the world, Weese set about designing seven basic station types; in reality, except for platform/mezzanine configurations, there are only two basic types, the vaulted underground station and the aerial stations. In all, the stations are consistent and disciplined as befits the nation's capital. The underground stations evoke serious civic architecture in the tradition of grandeur, order, and harmony. Everything is out in the open six-hundred foot long, sixty foot wide, thirty foot high tunnel, the mezzanine, the escalators (there are no stairs), and the platform itself. There are no long circuitous

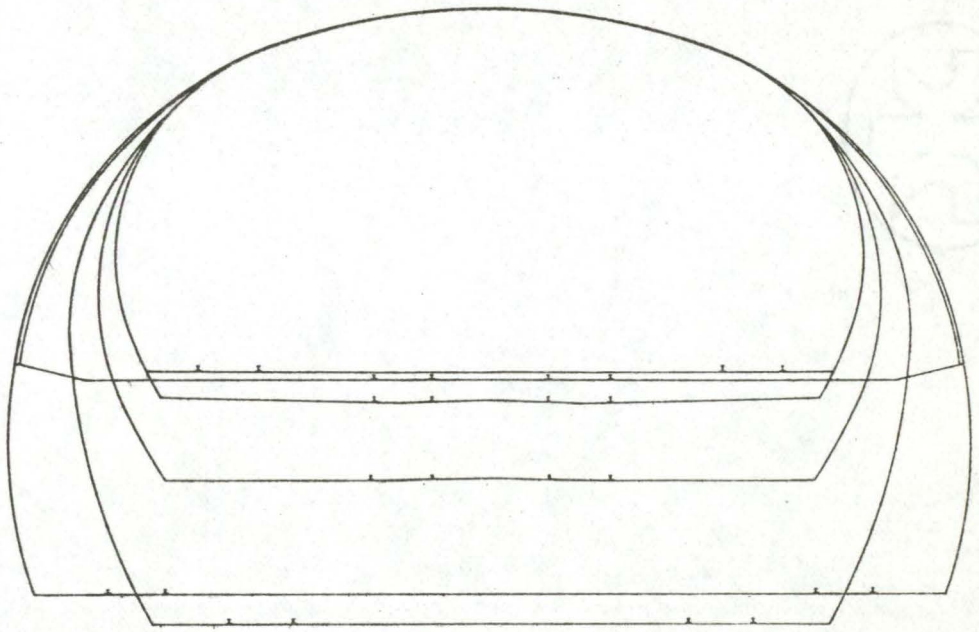


Figure 12. Varying Profiles of Underground Stations, Washington.

tunnels, no dark corners, no concessions, no pillars. Indeed, security has been a prime design consideration. There is almost no advertising. Weese believes motion to be the essence of the system, and he therefore sees no reason to linger and no reason to integrate works of art into station design.

While entrances have not been canopied, they are by no means overlooked. Rich granite and pylons bearing the symbol "M" (for Metro) define entrances. One weakness of the system, cited by almost everyone and acknowledged by the architects,[29] is the graphics. Station names are printed vertically on pylons set at forty-five degree angles to circulation paths, and as trains enter stations, passengers hardly have time to comprehend the station name; if passengers are standing, they cannot see it at all. Another weak point, the architects concede,[30] is the lighting system employed in stations. While there is ample light to read by, none of it is direct. In an underground situation, patrons are generally found to be ill at ease when

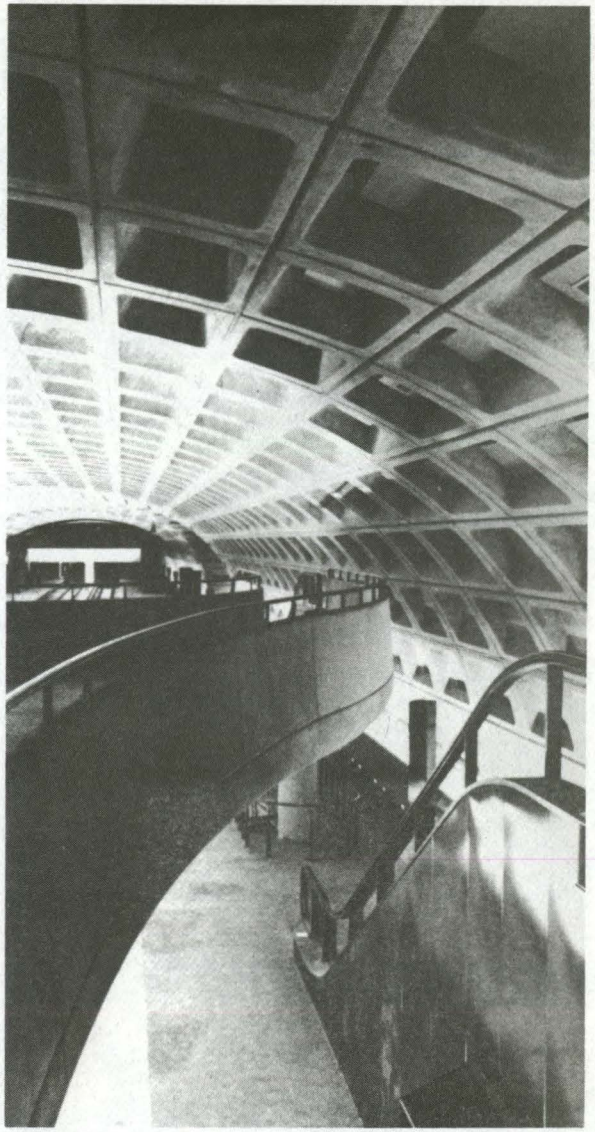


Figure 13. Judiciary Square, Washington.

lighting even seems to have been somewhat oppressed. Station furniture seems to have been clumsily handled; elevators for wheelchair patrons were not included in original station design and are often placed in awkward locations.

Metro's stations, aside from being well designed, are to a great extent suited peculiarly to Washington. Each station identifies with the federal city image rather than relating to its own immediate environment. While they are not futuristic images of transportation, as Dulles Airport might be thought to be, they are enduring examples of structural expression, interpenetration of spaces, and systematic solution.

San Francisco BART

Although the Bay Area Rapid Transit District (BART) publicizes the fact that a diversity of architects, some with considerable reputations, were involved in the design of stations, these architects learned soon after they were hired that their job was mainly to apply finishes and install entrances to structures whose basic configurations were determined years in advance by the engineering firm, Parsons, Brinkerhoff, Tudor, Bechtel. Crude sketches prepared by the engineers took little cognizance of the personal experience of the traveler beyond his simple physical movement, and still less notice of the enormous impact the stations would have on surrounding urban fabric. Yet somehow, these sketches hardened into nearly final designs which lacked notably an element of humanism. The array of stainless steel, high-performance escalators, closed-circuit television, and lavish space allocations are points in favor, and the standardized graphics are extremely civilized, yet few of the stations express

Figure 14. Glen Park, San Francisco.

such a sense of civic awareness as is necessary to attract patrons to a transit system. Each architect, working within the limits imposed upon him by the engineers, came up with a different platform warning strip, for example. Some of the architectural complaints made to the engineers include the lack of interpenetration of spaces, overblown spaces, and forests of columns, while complaints made to architects include melodramatic roof structures and bewildering assortments of surface materials. Nonetheless, some critics have been so favorably impressed as to suggest that stations seem particularly thoughtful in terms of layout and visual organization.

Case Study Summary

While Washington's approach is to opt for consistency, and therefore order and logic, San Francisco's approach has been described as an architectural free-for-all. In Atlanta, the approach tends more toward the San Francisco concept except that stations will notably interrelate other modes of transportation much more conveniently and efficiently than in San Francisco or Washington. Architects will have a somewhat greater degree of freedom in design of stations. At the same time, the engineers must surely have learned from the San Francisco experience. At any rate, definite parameters set by the MARTA engineers include elevations and alignment of tracks; other design decisions will be in the sphere of the architect.

Place Bonaventure (Montreal)

San Babila (Milano)

Figure 15. Case Study Stations.

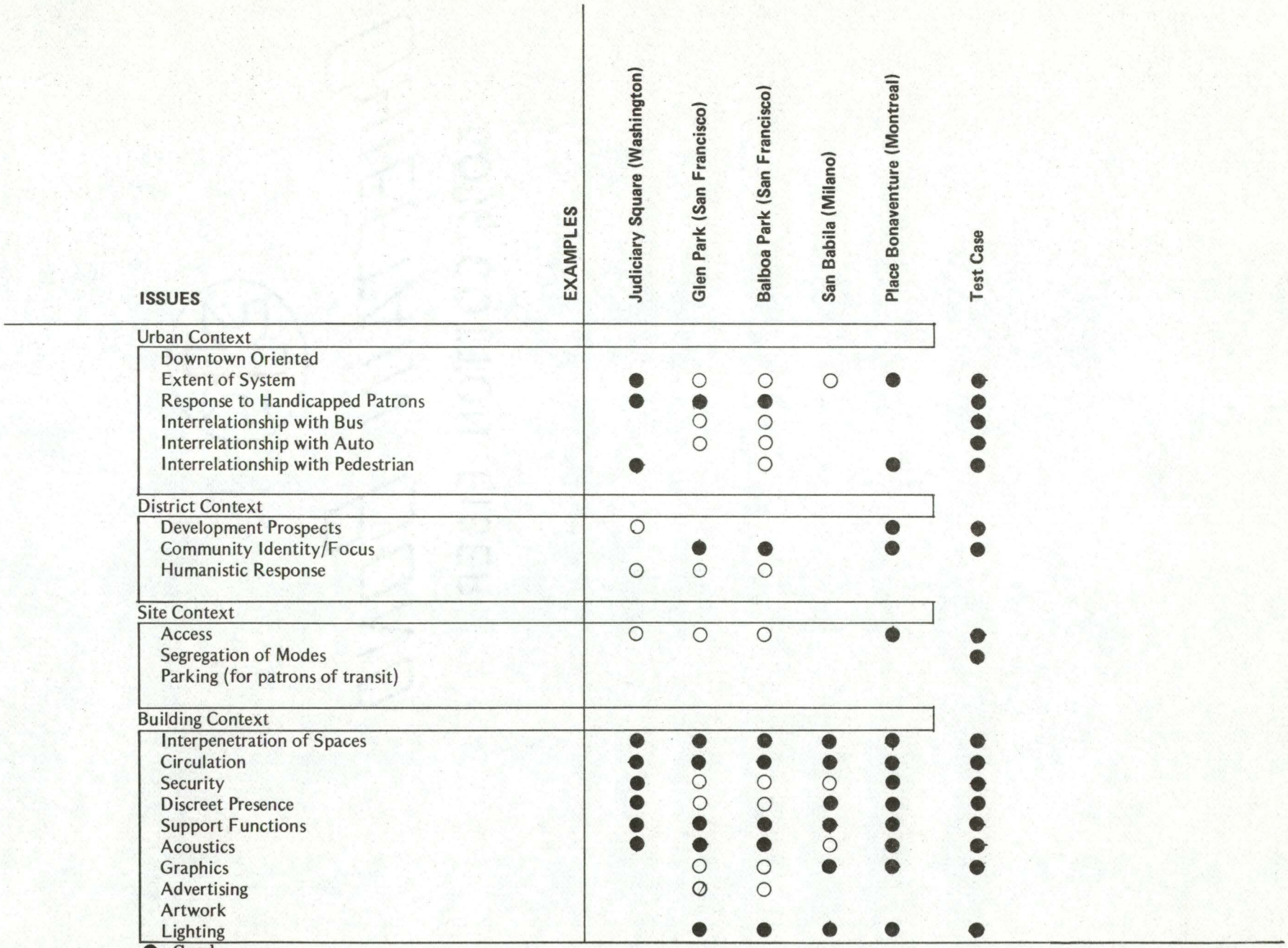


Figure 16. Case Study Checklist.

7 Conclusions

The final form of the Arts Center Rapid Transit Center has been determined by parameters set forth on scales ranging from the metropolitan region to the site and building itself. Among the most important of these parameters is the idea of segregating the various modes of circulation which come together at the Arts Center. Another important parameter is the development possibilities afforded by the Arts Center Station and its site. Other strong determinants include a uniform and clearly comprehensible system of graphics, lighting levels and the introduction of natural light into an underground situation, acoustic levels, and security.

The topography of the site and patronage analysis have indicated primary pedestrian access to the station from directly above. The integration of the bus mode has led to a bridge concept and entrance from the far west side. The likelihood

of outdoor activities in conjunction with the Arts Center and with development on the station site, as well as the need for a strong visual orientation axis with the Arts Center building, determined the establishment of a pedestrian plaza at the center of the site. Kiss-and-Ride patrons approach the station by means of this same plaza so that anyone who does not arrive by train or bus arrives as a pedestrian.

A system of graphics consistent with other components of the MARTA system was considered important in maintaining easy access to stations. Entrances are marked by pylons eight feet tall with a simple "M" (for MARTA) at the top. Once inside, all directional signs leading to trains or buses are executed in orange (Arts Center Station is located on the "Orange" line), and signs leading away from trains and buses are white. All letters are backlit for better visibility.

The likelihood of future development precludes the inclusion of natural lighting throughout the station; however, a large light well covers the entrance to the station, and a

portion of the wall facing the bus platforms is glazed in order to ensure visual contact with buses while excluding noise and exhaust problems.

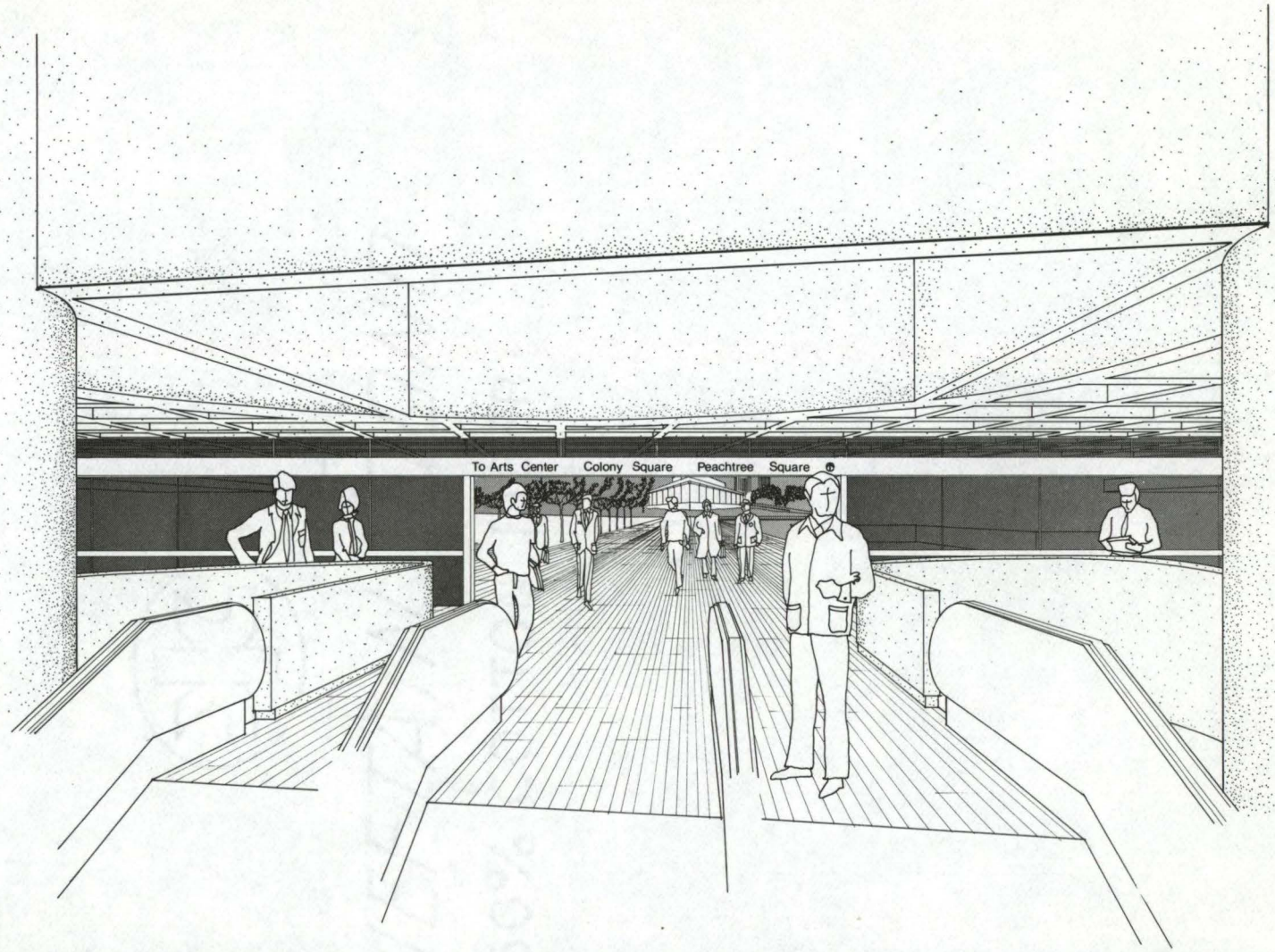
Excluding bus platforms from the enclosure eliminates a great deal of the acoustic problems, at least within the structure. The reduction of noise levels was one of the determinants for the structural system in that the deep coffers serve to baffle and therefore reduce sound. In strategic spots where sound levels are likely to be greatest, panels of sound absorptive materials have been applied in an effort to reduce noise levels to the degree prescribed in Chapter 5.

In an effort to ensure security among patrons as well as for the station itself, only one major entrance has been provided. Insofar as was possible, the interior is barrier-free and column-free, and closed-circuit television cameras view every portion of the station. Floors have been made of nonslip materials, and lighting levels are such that the immediate as well as the

ultimate destination of a patron are in full view and readily discernible.

The structural system employed in the station derives directly from an effort to provide developers as much flexibility as possible in building air-rights structures directly above the station. The system allows for developers to recognize the line of the street system or to conform to the axis of the station itself.

The parameters set forth by the region, site, and building program have by and large determined the form and configuration of the Arts Center Rapid Transit Station.



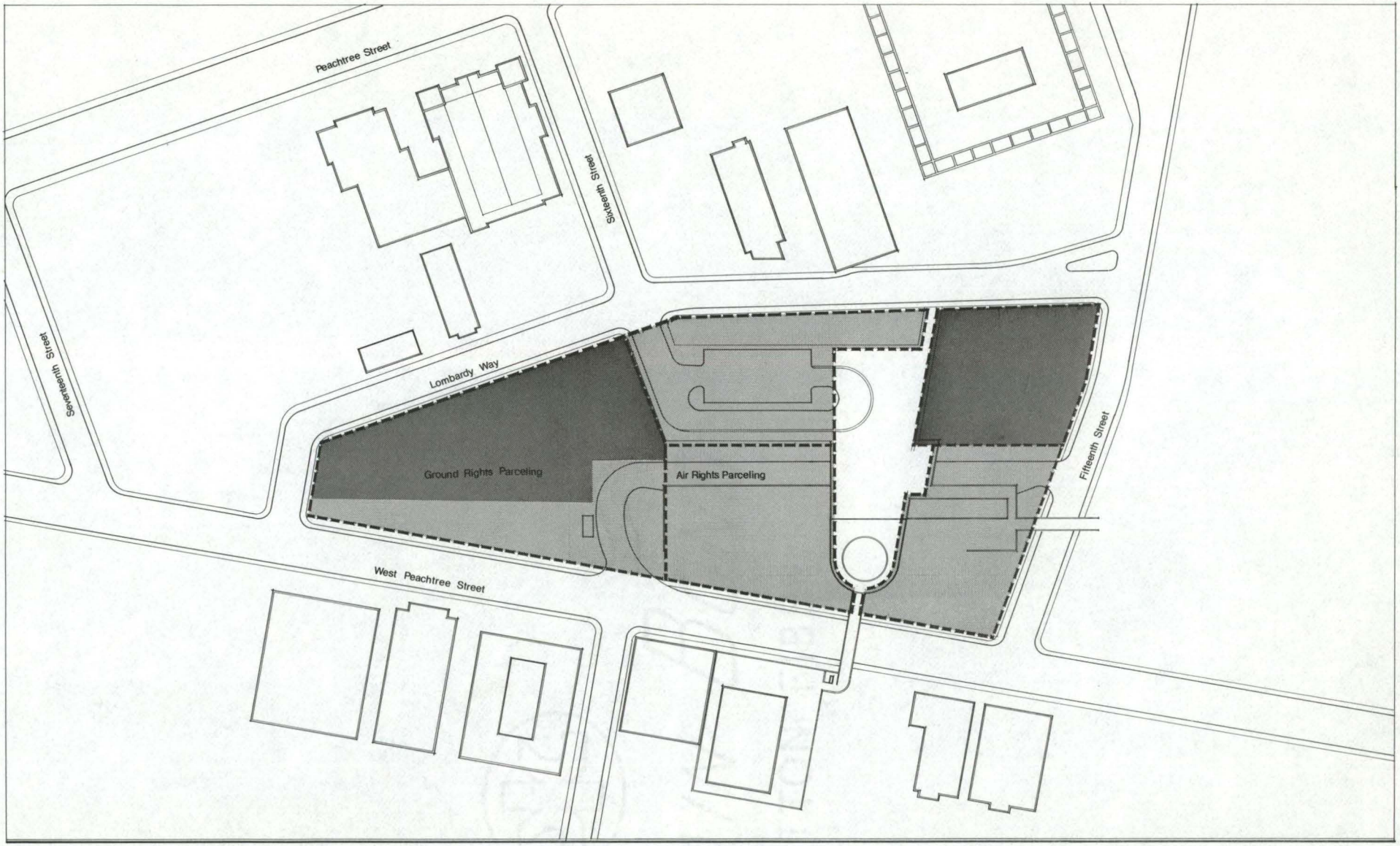
A Neighborhood Rapid Transit Center

Arts Center Station Atlanta, Georgia

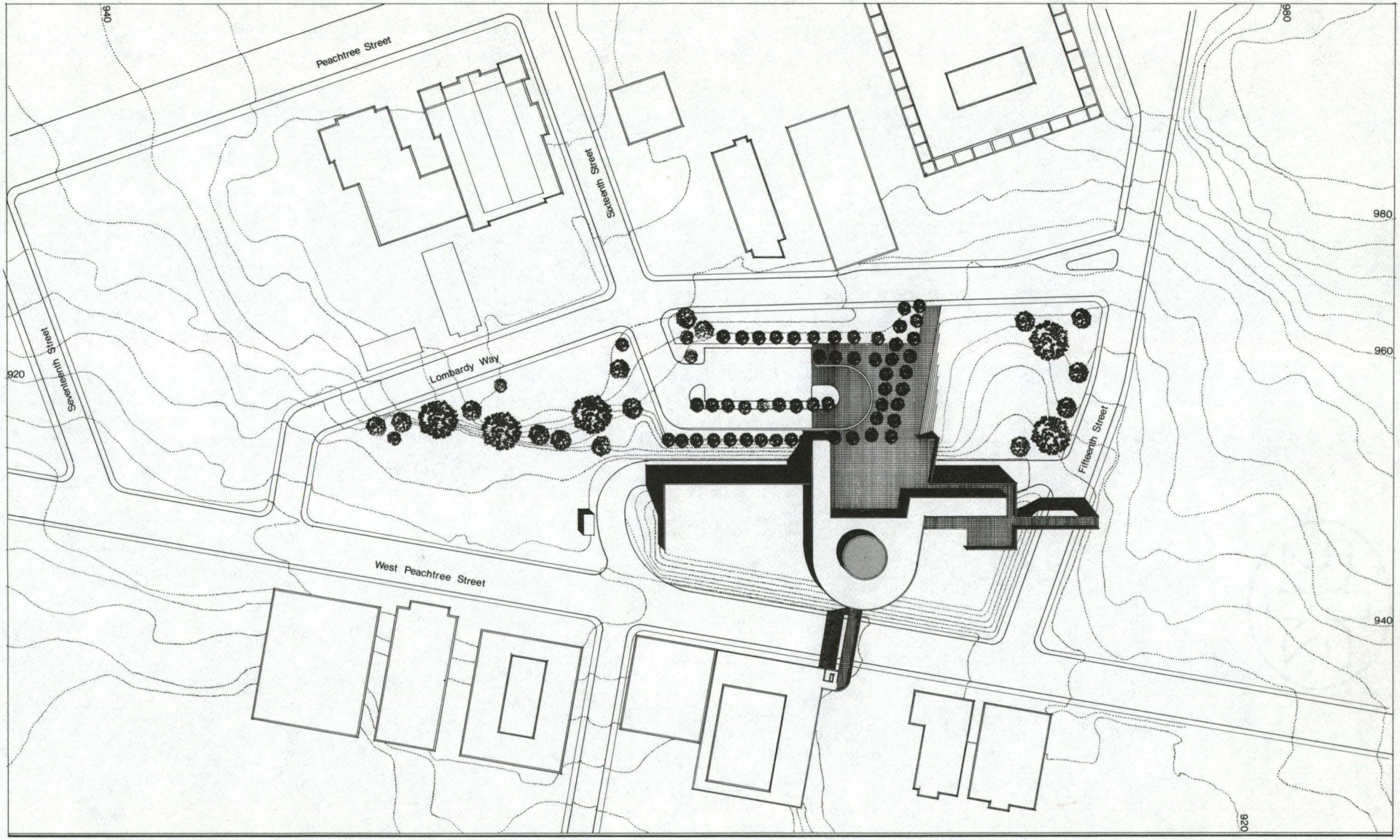
Terminal Project

Spring 1977

Kenneth H. Brown, Jr.



Future Development


Peachtree Street
Sixteenth Street
Seventeenth Street
Lombardy Way
West Peachtree Street
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0
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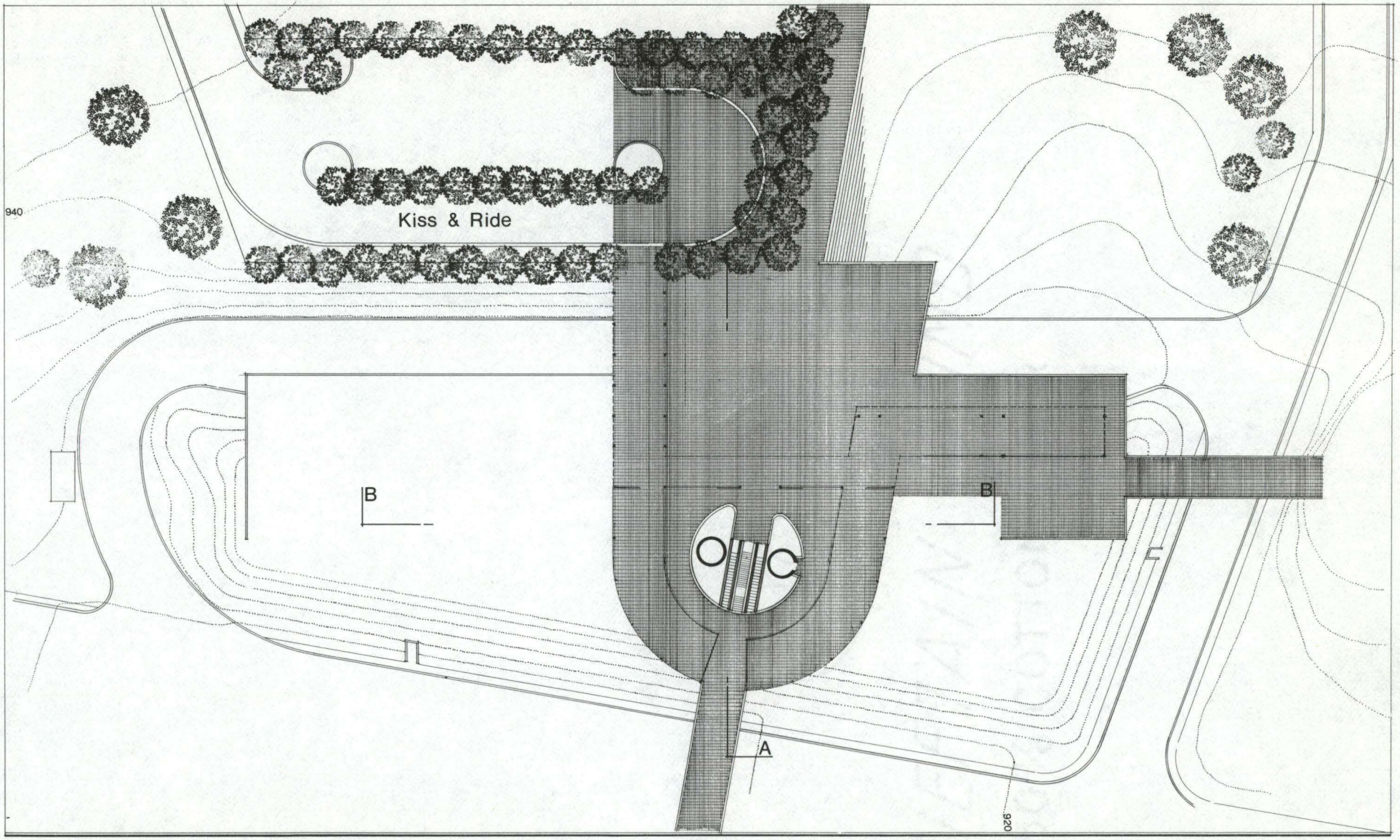
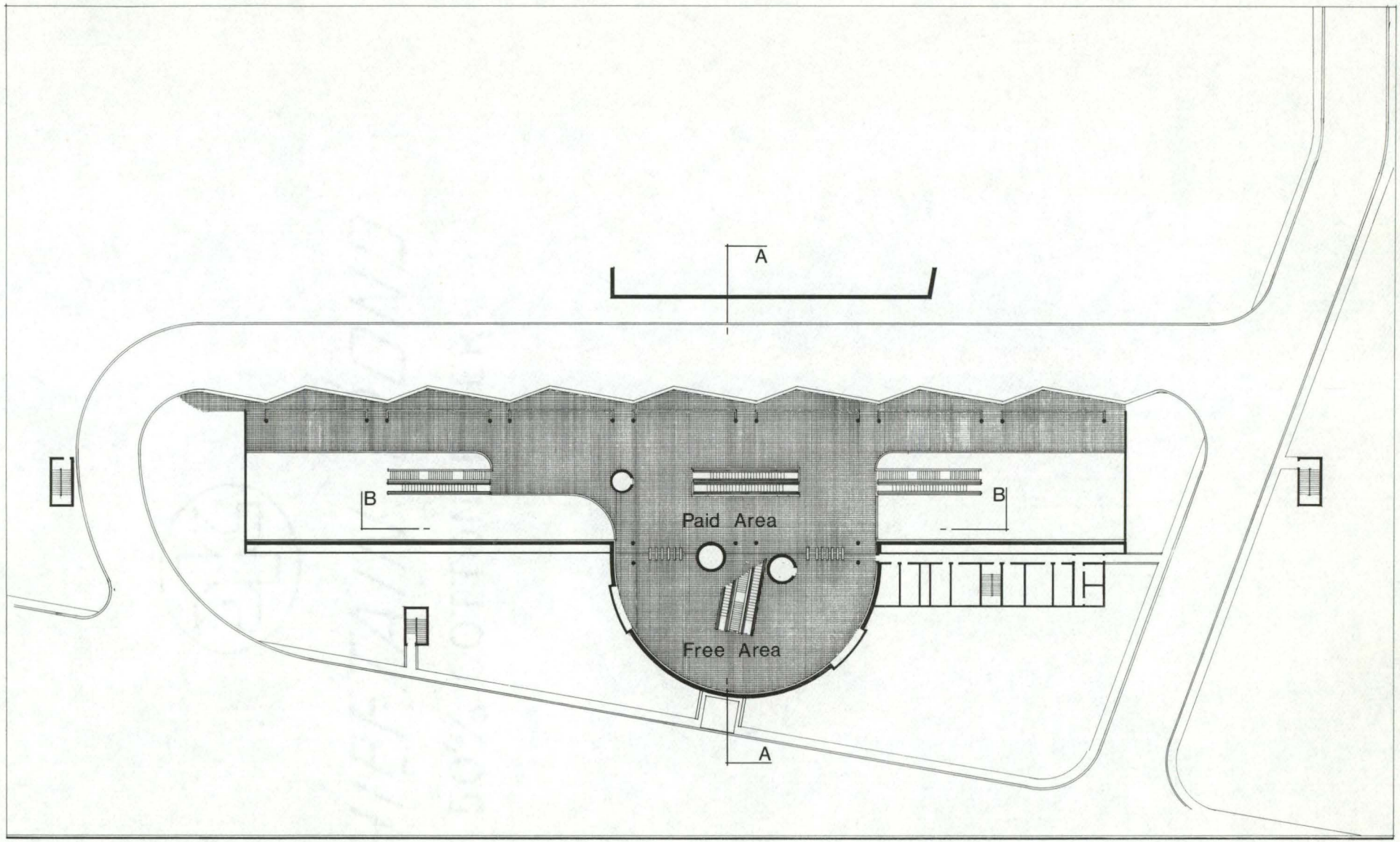
100

Site Plan

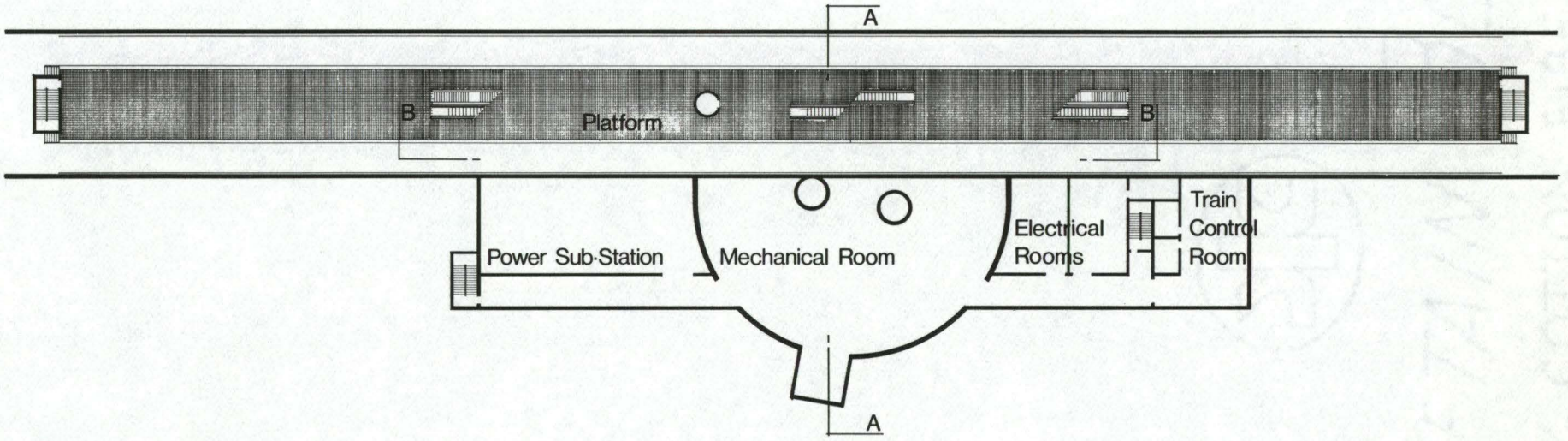


Plaza Entry Level

0 10 20 40

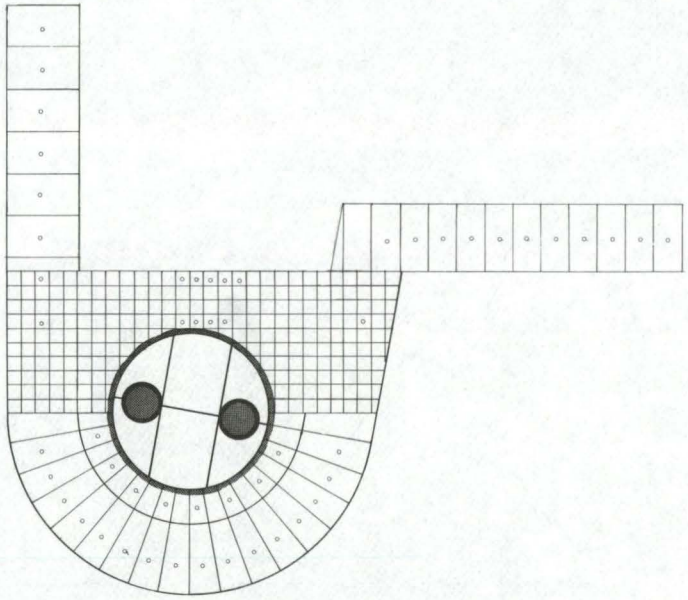


Mezzanine Level



Platform Level

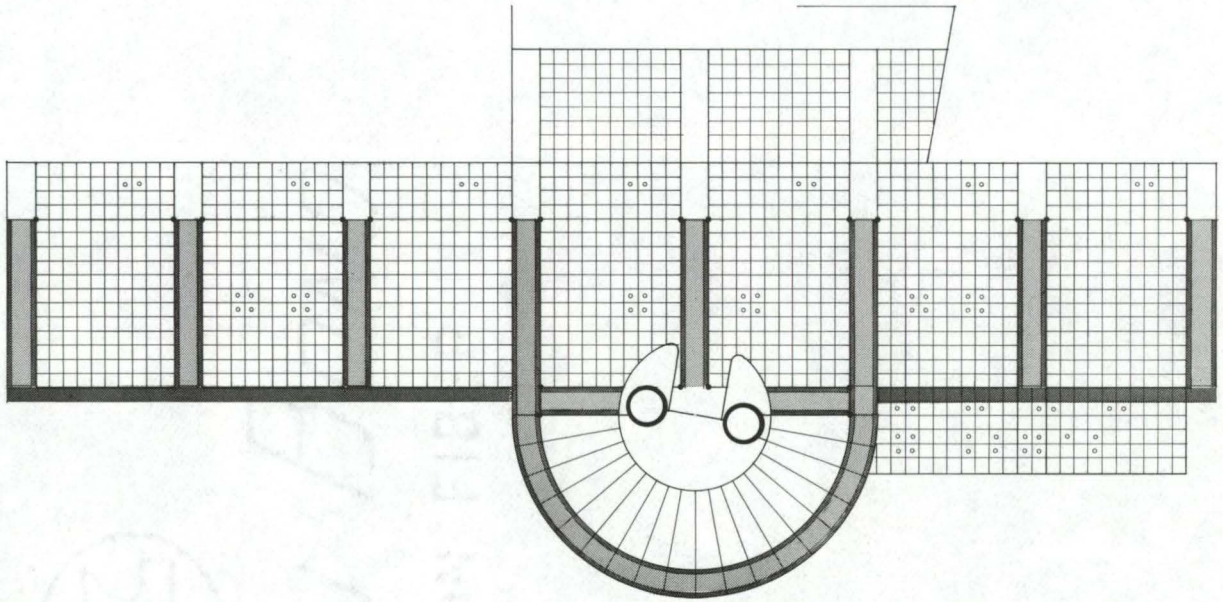
0 10 20 40



Plaza Entry Level

Framing ○ Lighting ○ Mechanical

0 10 20 40



Mezzanine Level

Framing ○ Lighting ○ Mechanical

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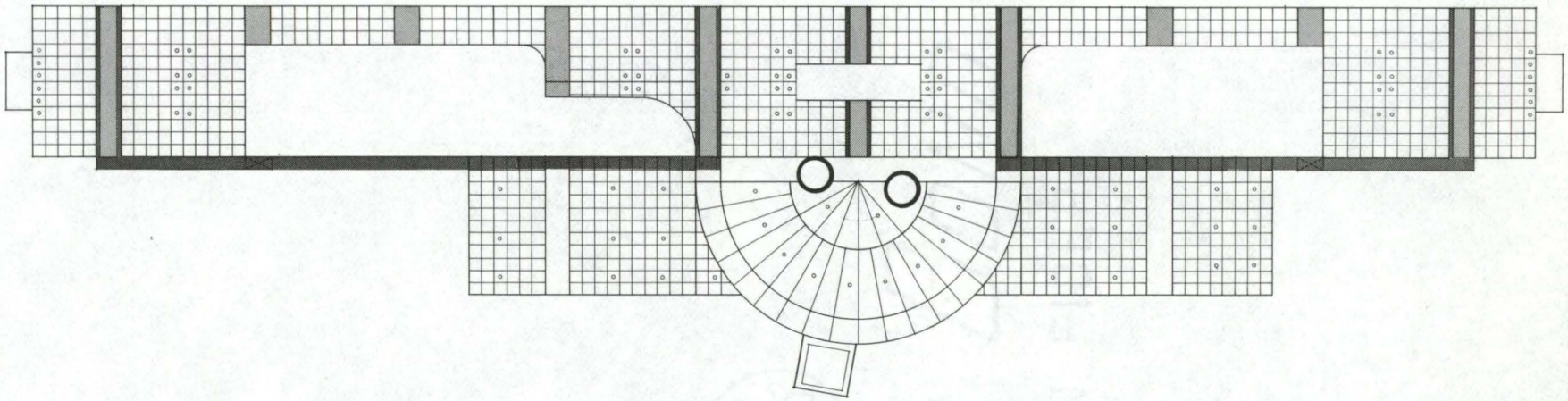

Platform Level

Framing ○ Lighting ○ Mechanical

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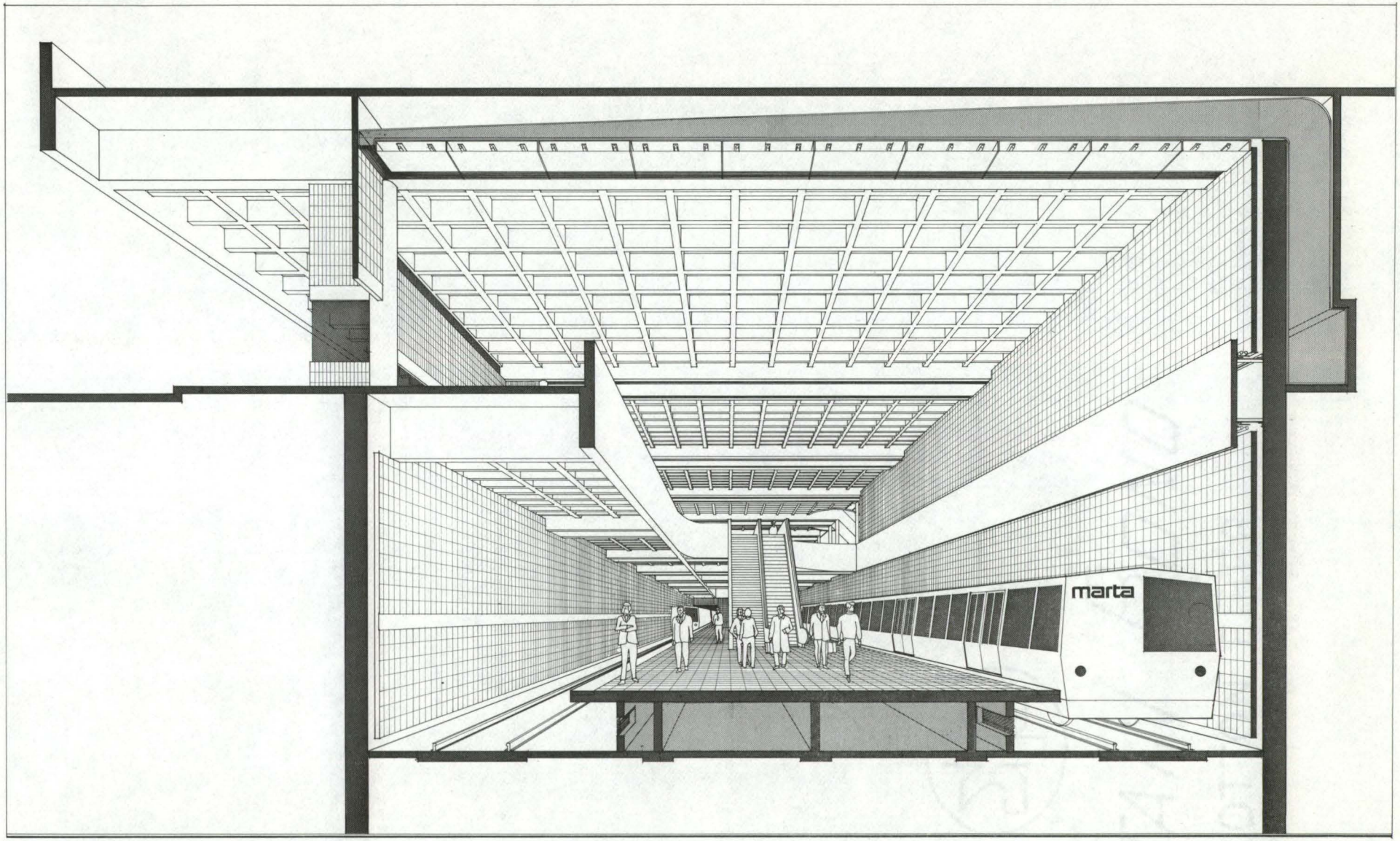
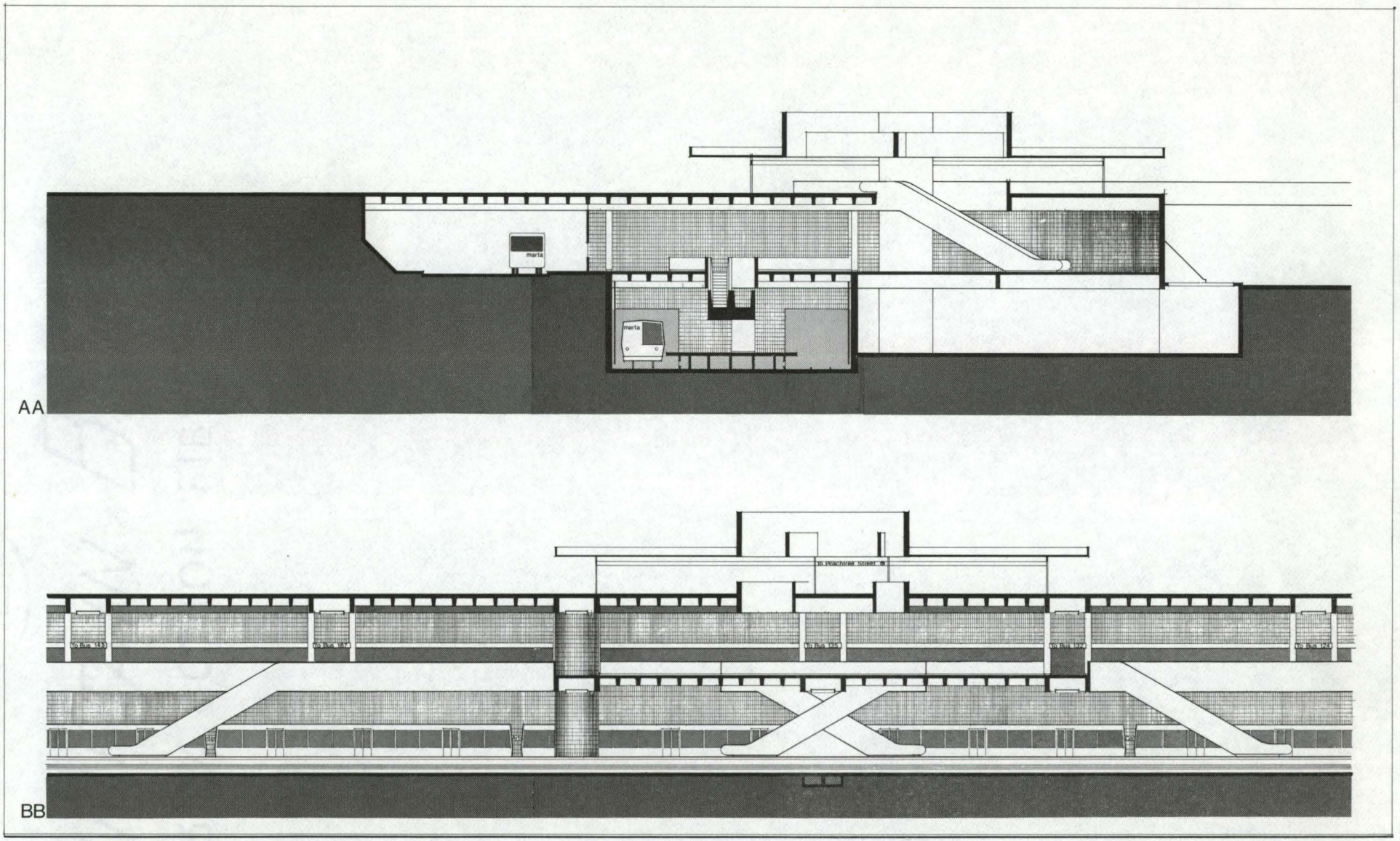


Perspective



Sections

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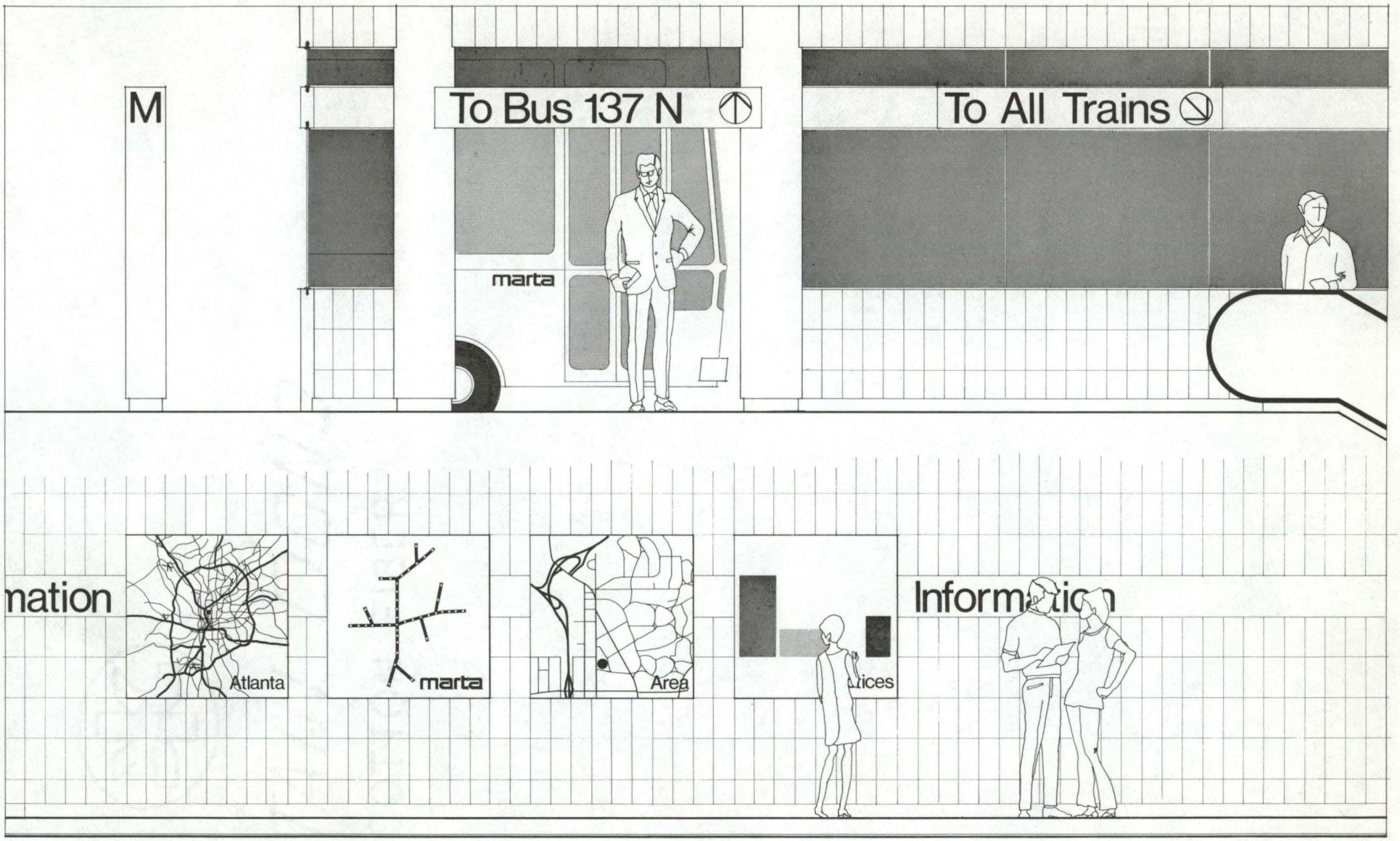

Graphic Details

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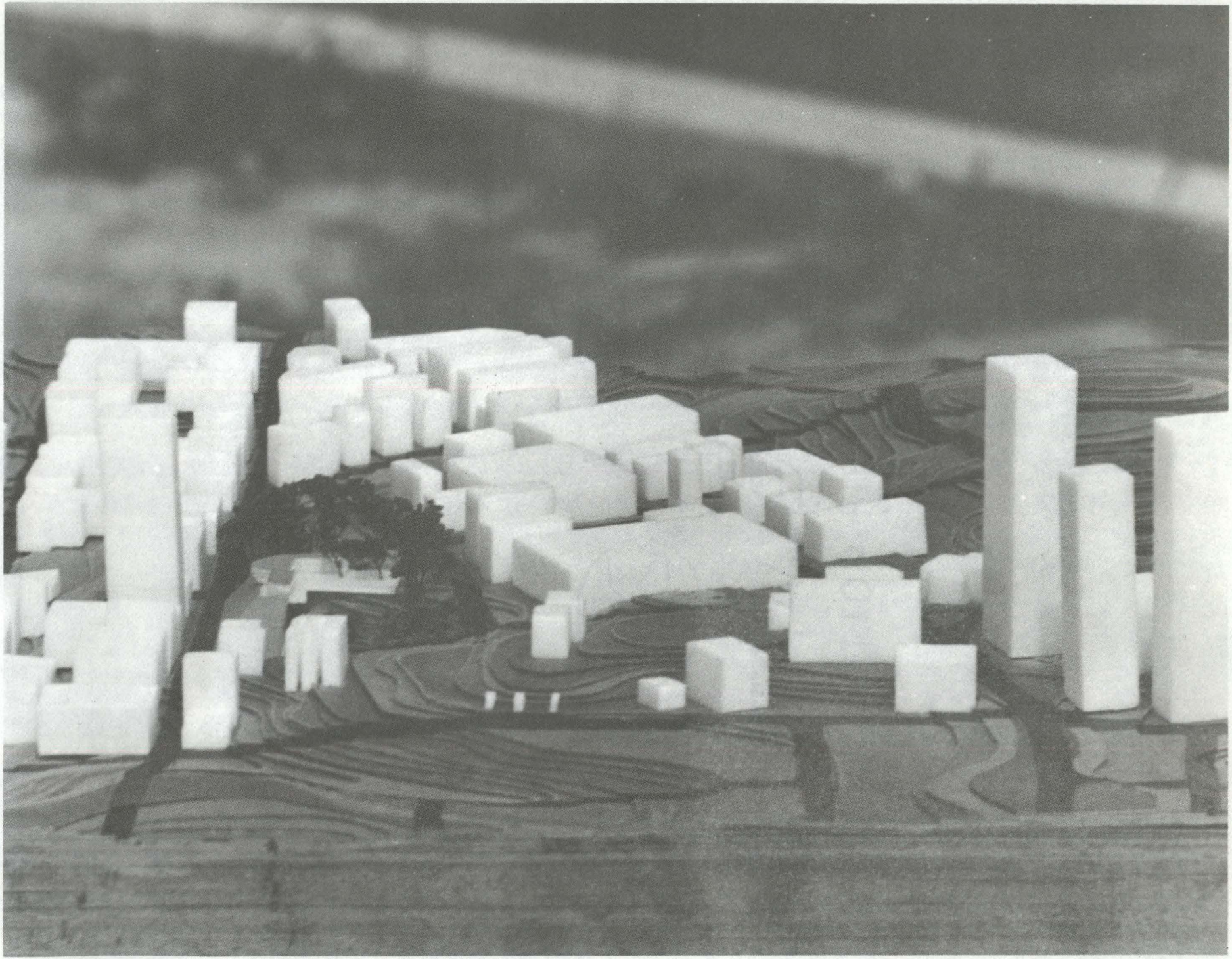

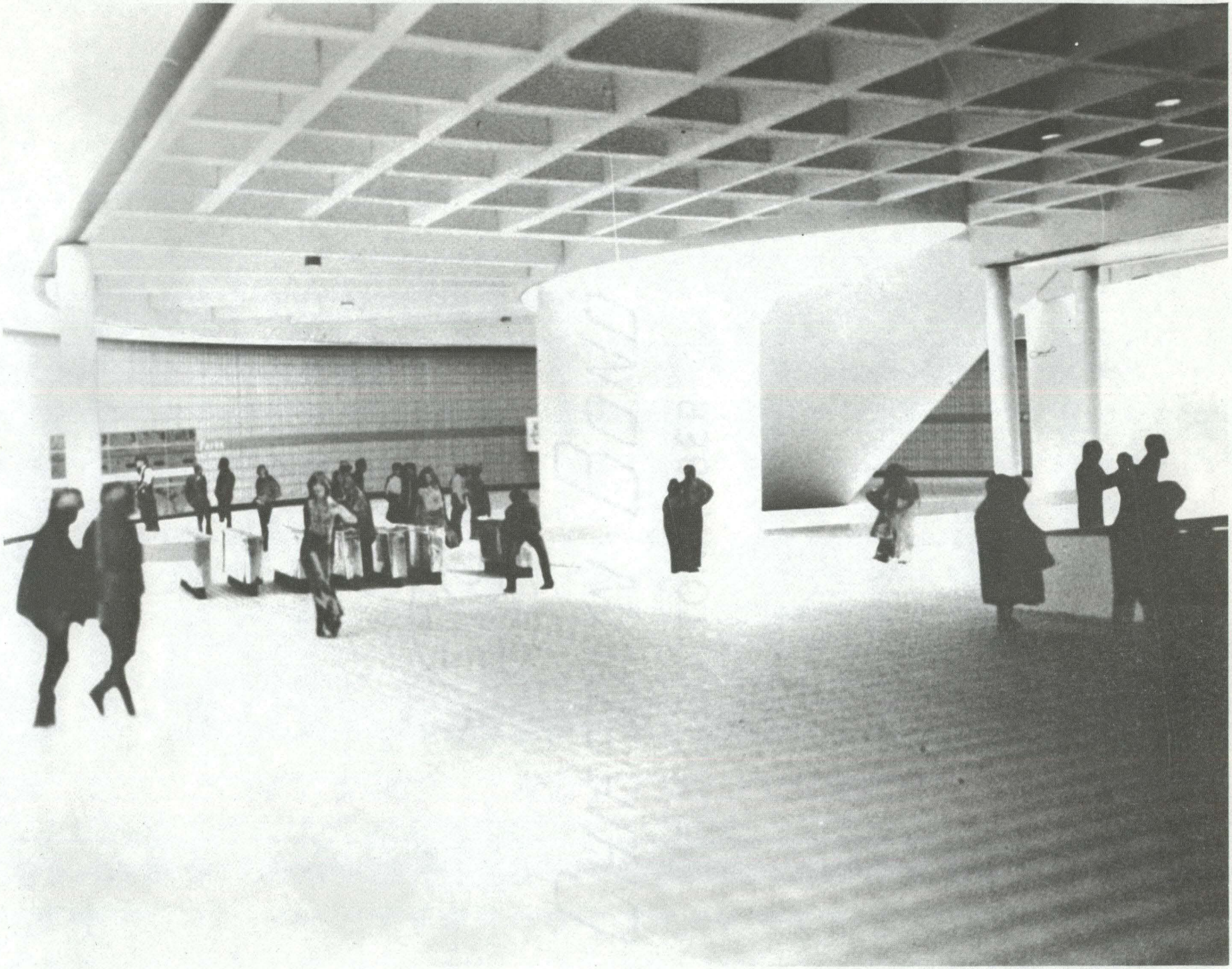

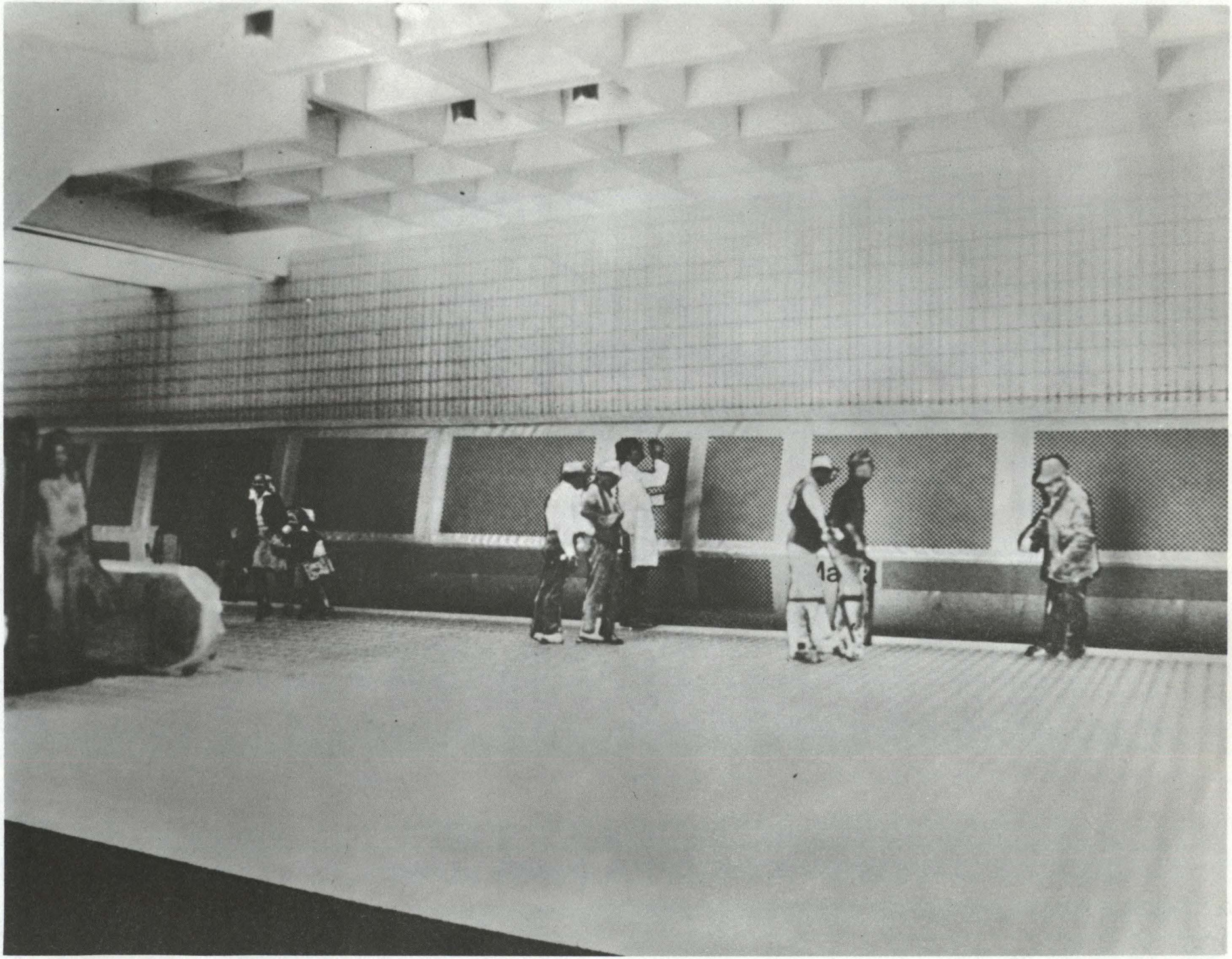
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Footnotes

1. "The Soft Revolution," Architectural Forum (January/February, 1968), p. 87.

2. "Urban Transportation Policy: Where Do We Go From Here?" AIA Journal (December, 1975), p. 28.

3. Ibid., p. 29.

4. Ibid., p. 34.

5. Architectural Forum, "Soft Revolution."

6. Ibid.

7. "Transit's Power to Shape a Region," Architectural Forum (January/February, 1968), p. 57.

8. Ibid., p. 87.

9. Ibid., p. 88.

10. AIA Journal, p. 52.

11. G. Eric Harkness, Arts Center Station Area Development Plan, Bureau of Planning, Department of Budget and Planning (Atlanta, 1974), p. 22.

12. Metropolitan Atlanta Rapid Transit Authority/Chronology (Atlanta, 1975), pp. 1-5.

13. Analysis of Transit Passenger Data (Atlanta, 1973), pp. 6-7.

14. Ibid., p. 7.

15. Ibid., p. 2.

16. "After a Half-Century Hiatus, a Spate of New Transit Systems," AIA Journal (December, 1975), p. 37.

17. Ibid., p. 48.

18. Ibid., p. 16.

19. Ibid., pp. 42-43.

20. Ibid., p. 37.

21. Ibid., p. 34.

22. Ibid., p. 19.

23. Ibid., pp. 42-43.

24. Transit Station Area Development Study Arts Center Design Plan January 1976. Department of Budget and Planning, Bureau of Planning (Atlanta, 1976), p. 12.

25. Ibid., p. 53.

26. Ibid., pp. 53-54.

27. Ibid., p. 54.

28. Patronage Summary Pershing Point Station. Prepared by Parsons, Brinckerhoff, Tudor, Bechtel General Engineering Consultants (Atlanta, 1974).

29. Gori, Luca, Harry Weese & Associates, Architects and Engineers, Washington, D. C. Interview Dec. 14, 1976.

30. Ibid.

Bibliography

Myers, Sumner. "The Soft Revolution," Architectural Forum, Vol. 128 (January/February 1968), pp. 86-89.

"Traffic in Cities," Architectural Forum, Vol. 128 (January/February 1968), pp. 47-114.

Bailey, Jim. "BART: The Bay Area Takes a Billion-Dollar Ride," Architectural Forum, Vol. 124 (June 1966), pp. 38-61.

Liskamm, William H. "BART: Although It Took Twenty Years to Complete, America's Newest Rapid Transit System is Right on Time," Architectural Forum, Vol. 138 (April 1973), pp. 44-48.

"After a Half-Century Hiatus, a Spate of New Transit Systems," AIA Journal, Vol. 64 (December 1975), pp. 35-37, 52.

"The Architecture of Transportation," AIA Journal, Vol. 64, (December 1975), pp. 23-52.

Germano, T. and D. Willmer. Patronage Summary Pershing Point [Arts Center] Station. Atlanta, 1974.

Harkness, G. Eric. Arts Center Station Area Development Plan. Bureau of Planning Department of Budget and Planning. Atlanta, 1974.

Arts Center Transit Station Area Development Study. Atlanta: Department of Budget and Planning, Bureau of Planning, 1976.

Lynch, Kevin. The Image of the City. Cambridge: The M.I.T. Press, 1973.

Pushkarev, Boris, with Jeffrey M. Zupan. Urban Space for Pedestrians. Cambridge: The M.I.T. Press, 1979.

"Two BART Stations," Architectural Record, Vol. 156 (November 1974), pp. 113-120.

An Economic Base Study of the Atlanta Region. Atlanta Regional Commission. Atlanta, 1975.

The Model Cities Program. Department of Housing and Urban Development. Washington: Government Printing Office, undated.

Summary Report No. 1, Analysis of Transit Passenger Data. Metropolitan Atlanta Rapid Transit Authority. Atlanta, 1973.

MARTA -- We're Building . . . 1975 Annual Report. Atlanta, 1975.

Breines, Simon and William J. Dean. The Pedestrian Revolution Streets Without Cars. New York: Vintage Books, 1974.

"Metro Architecture," Potomac Valley Architect, Vol. 14, No. 6 (1971), pp. 1-7.

Miller, Nory. "Washington's Metro: It Works and It Looks Good," Potomac Valley Architect, Vol. 14, No. 6 (1971), pp. 8-15.

Parsons, Brinkerhoff, Tudor, Bechtel. MARTA Manual of Architectural Design, Vol. 4. Atlanta, 1974.

Parsons, Brinkerhoff, Tudor, Bechtel. MARTA System Design Criteria, Vol. 3, Mechanical and Electrical. Atlanta, 1976.

Atlanta Zoning Ordinance. Department of Clerk of Council, Atlanta, Georgia. September 15, 1976.

Personal Interviews

Gori, Luca of Harry Weese & Associates, Architects and Engineers. Personal interview held in Washington, D.C., December 14, 1976.

Groat, Gary L., Deleuw, Cather and Company, Washington, D.C. Personal interview held in Washington, D. C., December 14, 1976.

Low, Douglas A., Skidmore, Owings & Merrill, Washington, D. C. Personal interview held in Washington, D. C., December 14, 1976.